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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 60
1947



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PUBLICATION NOTE

By a change in the By-Laws of the Biological Society of Washington, effective March 27, 1926, the fiscal year now begins in May, and the officers will henceforth hold office from May to May. This, however, will make no change in the volumes of the Proceedings, which will continue to coincide with the calendar year. In order to furnish desired information, the title page of the current volume and the list of newly elected officers and committees will hereafter be published soon after the annual election in May.

All correspondence should be addressed to the Biological Society of Washington, c/o U. S. National Museum, Washington, D. C.

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DATES OF ISSUE.

The Committee on Publication declares that each paper of this volume was distributed on the date indicated on its initial page. The contents, minutes of meetings, and index for 1947 (p. v-169-178) were issued on March 26, 1948. The title page and lists of officers and committees for 1947-1948 (pp. i-iv) were issued on July 2, 1947.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS

The Society meets from October to May on the second Saturday of each month at 8 P.M. All meetings in 1947 were held in Room 43 of the U. S. National Museum.

January 11, 1947—963d Meeting

President Wade in the chair; 76 persons present.

New members elected: Nathan Apple, H. A. Borthwick, M. W. Parker.

Formal communications: Frank Thone, A biologist at Bikini; A. J. Duvall and C. O. Handley, Jr., Land of the Eskimo.

February 8, 1947—964th Meeting

President Wade in the chair; 24 persons present.

New members elected: J. F. Gates Clarke, Philip HersHKovitz, Robert M. Mengel, Mrs. R. Simpson.

Informal communications: Frank Thone, Exhibition of recent books on biological subjects; E. H. Walker, Review of Plants of the Washington-Baltimore area, by F. J. Hermann.

Formal communication: A. B. Gurney, An entomologist in the Pacific.

March 8, 1947—965th Meeting

President Wade in the chair; 32 persons present.

Informal communications: E. H. Walker, Exhibition of Check-list of plants of the Washington-Baltimore area: Malcolm Davis, Note on observation of a wild Bald Eagle in the Zoo.

Formal communication: J. P. E. Morrison, The natural history of Bikini.

April 12, 1947—966th Meeting

President Wade in the chair; 34 persons present.

New member elected; Sophy Parfin.

Informal communications: Frank Thone, Exhibition of recent books on biological subjects; I. N. Hoffman, Exhibition of Spring in Washington.

Formal communication: D. G. Hall, Half a million miles by air.

May 10, 1947—967th Meeting

SIXTY-EIGHTH ANNUAL MEETING

President Wade in the chair; 24 persons present.

The President's address, to be printed in the Journal of the Washington Academy of Sciences, was read by title.

The reports of the Recording Secretary, Corresponding Secretary, Treasurer, and Committee on Publications were read. An informal report for the Committee on Permanent Funds was presented.

The annual election was then held, resulting as follows: President, J. W. Aldrich; Vice-Presidents, W. L. Schmitt, F. C. Lincoln, J. E. Benedict, Jr., J. A. Fowler; Recording Secretary, S. F. Blake; Corresponding Secretary, D. H. Johnson; Treasurer, A. J. Duvall; Members of Council, Malcolm Davis, H. J. Deason, W. Stickel, Hugh O'Neill, J. P. E. Morrison.

The election was followed by an open meeting, with 52 persons present, and with the following program:

Informal communication: Frank Thone, Exhibition of recent books on biological subjects.

Formal communication: W. E. Clyde Todd, Ungava and the Barren Grounds.

October 11, 1947—968th Meeting

President Aldrich in the chair; 110 persons present.

New members elected: Roger D. Hamilton, J. Leslie Gressett (life member).

Informal communications: H. B. Humphrey, Note on the Greater Snow Goose; Frank Thone, Exhibition of recent books of biological interest.

Formal communication: Hugh O'Neill, Practical botany in Alaska.

November 8, 1947—969th Meeting

President Aldrich in the chair; 60 persons present.

Informal communications: H. B. Humphrey, Note on the

effect of last spring's freeze on the food supply of squirrels; Frank Thone, Exhibition of recent books on biological subjects.

Formal communication: E. P. Walker, Experiences with small mammals.

December 13, 1947—970th Meeting

President Aldrich in the chair; 96 persons present.

New members elected: Dominic L. De Giusti, Arthème Dutilly, John A. King, John A. O'Brien, José Álvarez del Villar, Morris A. Raines, and Henry E. Wachowski.

Informal communications: Frank Thone, Exhibition of new books on biological subjects; C. C. Presnall, Note on a new rodenticide.

Formal communication: R. M. Gilmore, Antarctic wildlife.

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Vol. 60, pp. 1-8

April 3, 1947

OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

GEOGRAPHIC VARIATION IN THE SEA SNAKE,
HYDROPHIS ORNATUS (GRAY).

BY M. B. MITTLEMAN

In discussing *Hydrophis ornatus*, Smith (1926:82) says, "Apart from the marked sexual variation in the number of scale-rows upon the neck and body, there is considerable variation in different regions. . . . The number of dorsal cross-bars is variable and independent of geographical distribution." As defined by Smith, *Hydrophis ornatus ornatus* extends from the Persian Gulf to China and the Ryu Kyu Archipelago, and east to New Guinea and the Gilbert Island, giving way to *H. ornatus inornatus* in the Philippines, and *H. ornatus ocellatus* in Australia and adjacent Papuasias.

An examination of the data published by Smith (1926) and certain specimens in the United States National Museum, leads me to believe that Smith's race *ornatus* is a compound form, and that certain attributes of structure and pattern are correlated with geographic distribution.

For example, if Smith's ventral count data are studied, it will be observed that in nine males from various localities in the Persian Gulf, Indian Ocean, Gulf of Siam, and Java (hereafter referred to as the Indomalayan population), the counts vary from 226 to 260. In 11 male specimens from Cochin China, China, and the Ryu Kyu Archipelago (hereafter referred to as the Chinese population), the ventrals range from 209 to 252. That the ventral counts of these two geographic samples are statistically different, is shown by the following tabulation:

Sample	Ventral Count Ranges and Frequencies	
	209 - 229	230 - 260
Indomalayan population	1	8
Chinese population	8	3

Application of the chi-square test of association indicates that these dispersions are highly significant, i.e., that the chances of the observed differences having arisen from random errors of sampling are considerably less than one in a hundred. Analysis of Smith's ventral count data for 11 females indicates a similar geographic variation. Thus, in

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six Indomalayan females the ventrals range from 224 to 312; two of the specimens have counts of less than 281 (244 and 250). In five Chinese females the ventrals range from 236 to 258. If the ventral count data for all 15 male and female Indomalayan specimens are pooled and then compared with the equivalent data for the 16 Chinese specimens, the following comparison may be made:

<i>Sample</i>	Ventral Count Ranges and Frequencies	
	209 - 240	242 - 312
Indomalayan population	4	11
Chinese population	12	4

These dispersions result in the highly significant chi-square value of 7.2; the distributions of the ventral counts of the two samples, as given above, will correctly separate 74% of the specimens according to geographic provenance.

A study of Smith's dorsal scale counts confirms the geographic segregation heretofore suggested. The body scale counts of 11 Chinese males range from 33 to 43, while those of the Indomalayan males range from 40 to 45. Nine out of 11 Chinese specimens have counts between 33 and 39, and the remaining two specimens have counts of 41 and 43. Conversely, all nine Indomalayan specimens have counts of 40 or more, so that if 39 is considered the arbitrary critical breakover point, we find that 18 (or 90%) of the 20 specimens can be correctly separated as to geographic origin by the body scale counts. Counts for the females of the two samples show a broad overlap, and do not permit a geographic separation, although there is evidence that with additional data such a split might become more apparent; the body scale count for Indomalayan females ranges from 43 to 55 (mean 48.5), while that of Chinese females varies from 39 to 51 (mean 45.6).

The neck scale counts are quite distinctive for the two samples. Nine Chinese males have counts between 28 and 31, and two have counts of 32 and 33 respectively. By contrast, only one Indomalayan male has a count lower than 32 (31), while the remaining eight vary from 32 to 37. Thus, 85% of these specimens are geographically separable on the basis of their neck scale counts. Females show a similar disparity; five out of six Chinese specimens have counts between 31 and 37, while the sixth specimen has a count of 39. In all six Indomalayan specimens the count is 38 or more (range 38-45). Hence, 11 out of 12 females (91%) are determinable on the basis of the neck scale count.

In addition to these differences, Chinese specimens (as pointed out by Smith, *loc. cit.*) have the posterior sublinguals well-developed, while Indomalayan specimens have these scales reduced. Smith believes that the number of dorsal cross-bars is independent of geographic distribution, but certain data appear to refute this idea. Thus, Smith says that three specimens from the Gulf of Siam have 38, 30, and 38 cross bars respectively, while two from Cochin China have 49 and 59 bars apiece. Four snakes from Ishigaki Shima, Ryu Kyu Archipelago (♀, ♂, ♂, ♂) have 54, 47, 47, and 51 bars respectively. It would seem, so far as these limited data go, that specimens from the coasts of Cochin China

and the adjacent seas to the north and east have a greater number of cross bars than do more westerly specimens.

In view of the foregoing analyses, *Hydrophis ornatus ornatus* (Gray) may be diagnosed as follows: ventrals 226-260 (♂), 244-312 (♀); neck scales 31-37 (♂), 38-45 (♀); body scales 40-45 (♂), 43-55 (♀); posterior sublinguals reduced; dorsal cross bars approximately 30-38; Persian Gulf, Indian Ocean, Java, and the Gulf of Siam.

This definition does not embrace the population occurring on the coasts of China, Cochin China, and the Ryu Kyu Archipelago, which, lacking a name, may be designated as

***Hydrophis ornatus maresinensis*, n. ssp.**

Disteira godeffroyi Stejneger (*non* Peters), Herp. Japan, 1907: 430, figs. 352-354.

Hydrophis ornatus M. Smith, Monogr. Sea-Snakes, 1926: 81 (*part.*).

Type: USNM 33933 (♀), Ishigaki Shima, Ryu Kyu Archipelago, April-May, 1899; A. Owston, collector.

Paratypes: USNM 33934 6, same data as type.

Diagnosis: Ventrals 209-252 (♂), 236-258 (♀); neck scales 23-33 (♂), 31-39 (♀); body scales 33-43 (♂), 39-51 (♀); anterior and posterior sublinguals about equal in size; dorsal cross-bars approximately 47-59.

Distribution: Ryu Kyu Archipelago; Cap St. Jacques (Cochin China) to Tsingtao (Shantung Province), China.

Remarks: In the type and paratypes the third and fourth supralabials enter the orbit, as they commonly do in the typical race. The infra-labials are invariably 10, while the supralabials are 8 on six sides and 7 in the remaining two. The anterior temporals are single in all four specimens, with three of the specimens bearing two posterior temporals, and the fourth specimen with three posterior temporals. Preoculars one in all specimens, postoculars two on seven sides, three on the remaining one. Maxillary teeth posterior to the fang 12, 12, 13 in the three paratypes. The dorsal cross-bars are five or six scales wide on the dorsal mid line, and in two specimens they narrow to a single scale's width and continue across the abdomen, while in the other two specimens the cross bars end rather abruptly at about the tenth scale row.

Smith (*loc. cit*) has included four specimens from southwest New Guinea, the Gilbert Islands (co-types of *Hydrophis godeffroyi* Peters), and the Bismarck Archipelago, in *Hydrophis ornatus ornatus*. These specimens (all four are females) appear to me to be on the whole much closer to *H. ornatus ocellatus*, and probably should be assigned to that race. The scale counts of these Papuan specimens are as follows:

	Ventrals	Neck Scales	Body Scales
Gilbert Isls.	269, 285	33, 35	39, 42
Bismarck Arch.	263	34	46
S. W. New Guinea	284	41	53

These Papuan specimens differ sharply in their ventral counts from *maresinensis* females, and somewhat less so from *ornatus* females, al-

though an average difference of six scales separates the mean counts of the Papuan specimens (mean 275) and those of the *ornatus* females (mean 281). The neck scale counts of the Papuan specimens separate them from *ornatus* females with but little overlap, and slightly less so from the *maresinensis* females. The body scale counts of the Papuan specimens do not serve to separate them from either *maresinensis* or *ornatus*, being approximately intermediate between these two races. To sum up: the Papuan specimens are distinct from *maresinensis* on the basis of the ventral scale counts, and show a moderate overlap in the neck scale counts; from *ornatus* they differ most markedly in the neck scale counts, and only partially on the basis of the ventral scale counts.

Comparison of the scale counts of the Papuan specimens with those of two female and five male *H. ornatus ocellatus* (as reported by Smith, 1926: 84) from Australia and adjacent waters, does not reveal the close affinity which geographic proximity would suggest. However, if the average scale counts of the Papuan specimens are compared with the combined averages for both sexes in *ornatus*, *ocellatus*, and *maresinensis*, it is obvious that they are closer to *ocellatus*, as will be seen in the following tabulation:

Sample	No. of specimens	Scales		
		neck	body	ventrals
<i>ornatus</i>	15	36	44	258
<i>maresinensis</i>	16	32	40	233
<i>ocellatus</i>	7	35	48	288
Papuasians	4	35	45	275

In view of the fact that geographic proximity, and structural affinity in two out of three characters, suggest alliance with *ocellatus*, it may be concluded that the four Papuan specimens are best considered as belonging to that race.

The new race, *maresinensis*, does not appear distinguishable from the Philippine race, *inornatus*, on the basis of the neck, body, or ventral scale counts. However, the two races are separable by virtue of the narrower head in *inornatus*, in which the width of the head at the posterior edge of the supraoculars is less than half the length from the rostral to the posterior edge of the parietals; in *maresinensis* the width is more than half this length. Further, *inornatus* usually has two anterior temporals, while *maresinensis* has one; the maxillary teeth in *inornatus* are usually 10 or 11 (rarely 12), and are 12 or 13 in *maresinensis*; finally, *maresinensis* is boldly barred on the dorsum at all ages, while *inornatus* is a uniform gray above in all but the youngest specimens.

The four races of *ornatus* may be separated according to the following synopsis¹:

A. Male

1. Ventrals 246-290; body scales 45-49; flanks ocellated and spotted (rarely uniformly gray in old specimens). North Aus-

¹Subsequent to this writing, I have had an opportunity to study the data given by Bourret (*Les Serpents marins de l'Indochine Française*; 1935) for certain

tralian coast from Broome to the Hawkesbury River; West New Guinea; Aru Islands; Gilbert Islands; Bismarek Archipelago. *Hydrophis ornatus ocellatus*

Ventrals 195-260; body dorsal scales 33-45; either boldly barred above, or uniform gray 2

2. Head narrower (width at posterior edge of supraoculars less than half the length from rostral to posterior edge of parietals); maxillary teeth (excluding fangs) usually 10 or 11; adults uniform gray above, pale white below (juveniles with obscure, narrow bands). Manila Bay and Palawan.

Hydrophis ornatus inornatus

Head width greater (width at posterior edge of supraoculars more than half the length from rostral to posterior edge of parietals); maxillary teeth (excluding fangs) more often 12 or 13; boldly barred above 3

3. Ventrals 226-260 (230-260 in 89% of specimens); neck scales 31-37 (32-37 in 89% of specimens); body scales 40-45 (100% of specimens); cross-bars about 30-38; posterior sublinguals reduced. Indomalayan seas, from the Persian Gulf to the Bight of Bangkok *Hydrophis ornatus ornatus*

Ventrals 209-252 (209-229 in 72% of specimens); neck scales 28-33 (28-31 in 81% of specimens); body scales 33-43 (33-39 in 81% of specimens); anterior and posterior sublinguals about equal; cross-bars approximately 47-59. Ryu Kyu Archipelago; Cap St. Jacques (Cochin China) to Tsingtao (Shantung Province), China *Hydrophis ornatus maresinensis*

B. Female.

1. Ventrals 222-278 (222-264 in 82% of specimens); neck scales 31-39 (31-36 in 78% of specimens); body scales 39-51 (39-45 in 78% of specimens) 2'

Ventrals 244-336 (265-336 in 75% of specimens); neck scales 33-45 (37-45 in 75% of specimens); body scales 39-55 (46-55 in 67% of specimens) 3'

- 2'. Head narrower (width at posterior edge of supraoculars less than half the length from the rostral to the posterior edge of the parietals); maxillary teeth (excluding fangs) usually 10

Annamese and Cochin-China specimens of "*Hydrophis ornatus*." For the most part, this author's discussion is taken from Smith (1926); however, certain of his data (p. 43) shed additional light on the variations of *H. o. maresinensis*.

To judge from Bourret's data, specimens from Annam and Cochin-China (Phan-Thiet, Cap. Kéga, Cap. St. Jacques) are intermediate between *ornatus* and *maresinensis*. Unfortunately he has not given the sex of his specimens, so that it is difficult to make valid comparisons with other available data. However, on the basis of his ventral counts, his specimens appear (at least seven out of nine, and perhaps eight out of nine) to be females; if this surmise is correct, then so far as ventral counts are concerned, his specimens are much closer to *ornatus*. However, counts of neck scales, body scales, and cross-bars agree quite well with *maresinensis*. It would appear best, as suggested by these data, to consider southern Indochina (Cochin-China and southern Annam) a region of intergradation between *ornatus* and *maresinensis*.

or 11; adults uniform gray above, pale white below (juveniles with obscure, narrow bands). Manila Bay and Palawan.

Hydrophis ornatus inornatus

Head wider (width at posterior edge of supraoculars more than half the length from rostral to posterior edge of parietals); maxillary teeth (excluding fangs) usually 12 or 13; adults boldly barred above. Ryu Kyu Archipelago; Cap St. Jacques (Cochin China) to Tsingtao (Shantung Province), China.

Hydrophis ornatus maresinensis

- 3'. Neck scales 33-42 (33-37 in 67% of specimens); increase in scale rows from neck to body 6-15 (12-15 in 67% of specimens); flanks ocellated and spotted (rarely uniformly gray in old specimens). North Australian coast from Broome to the Hawkesbury River; West New Guinea; Aru Islands; Gilbert Islands; Bismarck Archipelago. *Hydrophis ornatus ocellatus* Neck scales 38-45 (100% of specimens); increase in scale rows from neck to body 5-10 (100% of specimens); adults and juveniles with prominent cross-bars. Indomalayan seas, from the Persian Gulf to the Bight of Bangkok.

Hydrophis ornatus ornatus

Acknowledgements

I am indebted to Drs. Doris M. Cochran and Alexander Wetmore for the loan of specimens in the collection of the United States National Museum. Mr. Hubert Kleinpeter, III, has helped me with certain literature references.

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1926. Monograph of the sea-snakes (Hydrophiidae). London: Printed by order of the Trustees of the British Museum; xvii + 1-130, pls. 1-2, figs. 1-35.

Stejneger, Leonhard

1907. Herpetology of Japan and adjacent territory. Bull. U. S. Nat. Mus., 58: xx + 1-577, pls. 1-35, figs. 1-409.

BIOLOGICAL SOCIETY OF WASHINGTON

SEVEN NEW AMERICAN MILLIPEDS

BY RALPH V. CHAMBERLIN

Representatives of the seven new species of millipeds here named and diagnosed were found in going over several small collections submitted to me for identification by Drs. V. E. Shelford, J. M. Linsdale and P. W. Fattig. The types of the new forms are retained in the author's collection.

STRIARIIDAE

Striaria carmela, new species

Figs. 1 and 2

A small form like *S. nana* but differing from that species conspicuously in the details of the anterior gonopods which are trilobed instead of bilobed, with the posterior or inferior lobe decidedly larger than the distal one instead of the reverse, and the distal lobe not incised apically. The long, caudally directed blade proximad of these lobes which is so pronounced in *nana* not present in *carmela*, being replaced by a simple acute angle or process as shown in the figure.

A brown form with a narrow yellow stripe on each side at the level of the pores. Also showing a median dorsal pale line.

Collum with the usual ten crests.

The more anterior tergites with well developed ventral crests but these fade out on later segments well in front of the middle of the body.

First legs of male enlarged as usual. None of joints of second legs in male bearing a special process or lobe.

Diameter, about .8 mm.

Locality.—California: Monterey Co., Hastings Reservation. March 24, 1946. A male and female taken under oak leaves by J. M. Linsdale.

CASEYIDAE

Caseya dynotypa, new species

Differing from other California species in having a rather broad median dorsal yellow stripe which embraces on each tergite a trapeziform light brown area. Dorsum each side of the yellow stripe nearly black; sides lighter brown, the pigment in longitudinal brown lines or stripes. On each side a series of vertically elongate light spots.

Length, 15 mm.

Locality.—California: Monterey Co., Hastings Reservation. One female taken by Dr. J. M. Linsdale February 14, 1946.

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LEPTODESMIDAE

Kepolydesmus mimus, new species

Fig. 3

Dorsum of the usual reddish brown color.

Antennae long and slender, subfiliform.

Tergites with transverse sulcus distinct but the tubercles obsolete or but weakly indicated. Keels high, their lateral serrulations, of which there are 3 to 5, minute or obsolete, the one at anterior corner usually more distinct than the others.

First two pairs of legs of the male reduced as in *K. anderisus*.

Gonopods of the male as shown in the figure (Fig. 3).

Width about 32 mm.

Locality.—Washington: Carson, Martha Creek. Several males and females, which had dried out after preservation, were taken on the flood plain. Collected July 10, 1945, by Dr. V. E. Shelford.

In structure of the male gonopods close to the generotype, *K. anderisus* Chamberlin of Idaho, but differing especially in the details of the median branch. In this the hook seems to be relatively smaller and to lie more transversely in *anderisus*, with the blade beyond its base shorter and showing a transverse furrow.

XYSTODESMIDAE

Dynoria parvior, new species

Fig. 4

A much smaller form than *D. icana* with dorsum black, or nearly so, the keels and a median dorsal series of dots yellow, the latter obscure in posterior region.

The keels relatively broad as in *D. icana*.

Gonopods of male of the same general form as those of the generotype but distinct in details; e.g. the proximal process of the telopodite is stouter and curved instead of straight and the terminal tooth is more slender. See further figure 4.

Length, about 18-19 mm; width, 7 mm.

Locality.—Georgia: Neel Gap. Four specimens taken June 23, 1946 by P. W. Fattig.

ATOPETHOLIDAE

Toltecolus chihuanus, new species

Figs. 5-7

Color a dark, olive gray, with dark annuli about caudal borders of metazonites. Legs dark chestnut.

Clypeal foveolae 5-5. Eyes very widely separated; ocelli arranged in 8 longitudinal series and the same number of transverse series.

Collum strongly narrowed down each side as usual, with the anterior margin conspicuously incurved at lower end, the elevation decreasing dorsad, the elevated border set off by a sulcus. (Fig. 5).

Segments smooth above. A true segmental sulcus absent above, though below indicated by a faint line which bends forward angularly at level of pore which it touches. Segments strongly striate below. Anal tergite rounded behind, the surface over caudal portion irregularly rugose.

In the male the first two pairs of legs are thickened and have the claws strongly enlarged. The claws of the following three pairs of legs also have enlarged claws but these decreasing from third pair to fifth.

Coxal processes of third legs of male extending back over bases of fourth legs, subcylindrical but with ventral face flattened or concave, the distal ends abruptly uncate.

The gonopods are as shown in the figures. Anterior sternite subquadrate; firmly seated in the shallow excavation on anterior face of gonopods.

Number of segments, in the male holotype, 51.

Diameter, 4.8 mm.

Locality.—Mexico: Chihuahua: Chihuahua City, Saltbush-acacia-grass complex. One male, July 23, 1944. V. E. Shelford, collector.

In *T. garcianus* Chamberlin, the generotype, the claws of the third, fourth and fifth pairs of legs are reduced instead of being moderately enlarged as in the present species.

SPIROSTREPTIDAE

Orthoporus chihuuanus, new species

Light brown, with strongly developed annuli of chestnut color. Legs dark, chocolate colored.

Eyes transversely elongate, triangular, with apex directed mesad; separated by about once and a half their transverse length.

Collum with lateral margin straight, or nearly so, over middle portion; with three major striae above the margining one and typically two short ones between the topmost of these and the one next ventrad of it.

Tergites appearing smooth and shining, although under sufficient magnification showing numerous minute punctae. Repugnatorial pore typically from once and a half to twice its diameter from the sulcus.

Last tergite obtusely angular behind; surface densely finely punctate.

Number of segments, 70.

Diameter, 8.8 mm.

Locality.—Chihuahua; Chihuahua City. One female taken July 2, 1944. Dr. V. E. Shelford, collector.

In the absence of a male it is impossible to speak definitely of the relationships of this form. Superficially it suggests *O. entomacis* Chamberlin of Arizona, but it is a substantially larger form with differences in the sulci of the collum that seem to be specific.

Orthoporus producens, new species

Fig. 8

Chocolate colored to chestnut with prozonites in some degree lighter. Legs chocolate colored. Collum with a lighter reddish yellow transverse band behind the anterior border which is connected by a median line with a similar but shorter band in front of posterior border.

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Ocelli in five transverse series which together form a narrow triangle of which the apex is mesad. The eyes separated by twice their transverse length.

The collum is characterized by having the lower anterior corner more or less produced as shown in the figure (Fig. 8) which also shows the typical arrangement of the sulci.

Surface of tergites under magnification showing the usual minute, dense punctae. Repugnatorial pore mostly from 3 to 4 times its diameter from the sulcus which is moderately widely excurved opposite it. Sulcus sharply impressed throughout. Anal tergite with median angle obtuse, rounded; posterior area set off by a shallow transverse sulcus; punctae coarser than those of other tergites.

Number of segments, 68-69.

Diameter, 7 mm.

Locality.—Arizona: Benson. Two females taken July 21, 1944. V. E. Shelford, Coll.

The sulcus of the somites much more sharply impressed than in *O. chihuensis*. It would seem to be readily distinguishable by the form of the lower end of the collum.

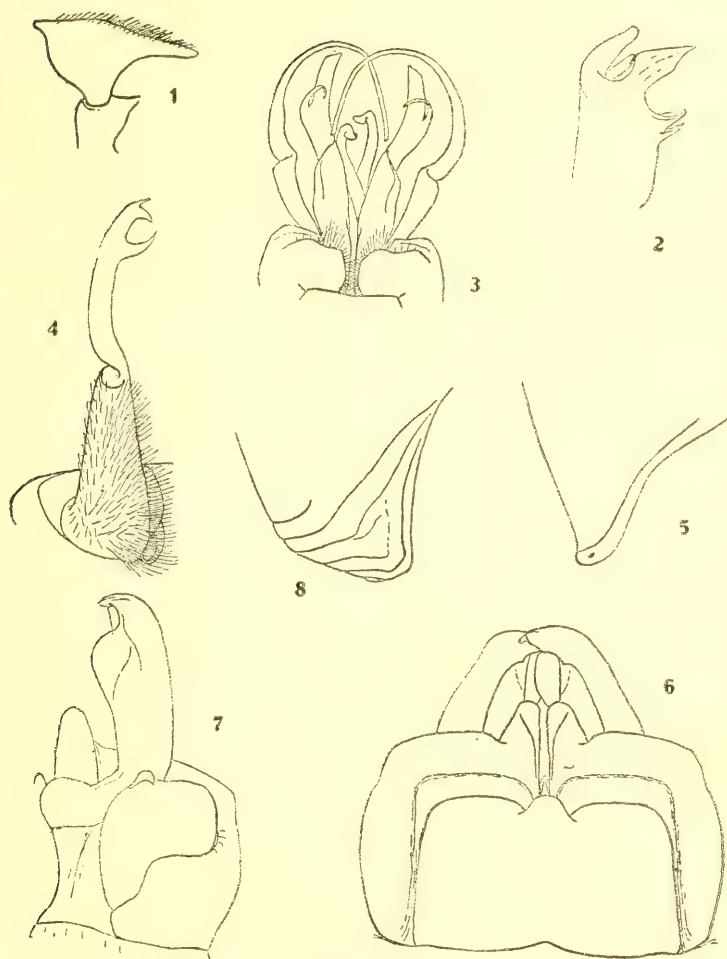


Plate I. New American Millipeds

Explanation of Figures

Striaria carmelo, n. sp. Fig. 1. Right posterior gonopod of male. Fig.

2. Right anterior gonopod of male, lateral view.

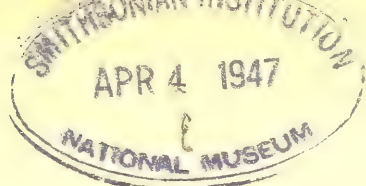
Kepolydesmus mimus, n. sp. Fig. 3. Gonopods of male, anterior view.

Dynoria parvior, n. sp. Fig. 4. Gonopod of male.

Toltecolus chihuanus, n. sp. Fig. 5. Lower end of collum, right side.

Fig. 6. Gonopods of male, anterior view. Fig. 7. Left gonopods of male, caudal aspect.

Orthoporus producens, n. sp. Fig. 8. Lower end of collum, viewed from right side.



PROCEEDINGS
OF THE
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FURTHER NOTE ON THE *RAMPHASTOS AMBIGUUS*
OF SWAINSON

BY W. E. CLYDE TODD

Some three years ago (Proc. Biol. Soc. Washington, 56, 1943, 157-159) I discussed the application of this name, which I tried to show belonged to the small form of Toucan from western Colombia misidentified by Chapman as *Ramphastos abbreviatus* Heine. Rejecting the latter name as then unidentifiable, or as possibly applying to an unknown Venezuelan race, I set up the name *innominatus* for the large Colombian bird which had heretofore been called *ambiguus*.

To this action Mr. Rodolphe Meyer de Schauensee (Proc. Philadelphia Academy Nat. Sci., 97, 1945, 11-16) promptly took exception, and presented evidence going to show that my conclusions in this case were unacceptable. Far from resenting criticism of this nature, I welcome such as another step toward the truth which we all profess to seek. Very recently, through the courtesy of Mr. William H. Phelps of Caracas, I have had the opportunity of examining and comparing a second specimen from the north coast of Venezuela—the same as is recorded by Dr. Eduardo Rohl (Bol. Soc. Venezolana Cienc. Nat., No. 21, 1935, 6) from a point north of Guatire. I use this opportunity to review the whole case as presented by de Schauensee, and my findings approximate his.

The whole question hinges on the colors of the bill in the living bird. It is true (as he intimates) that we know very little about possible seasonal changes in the color of the bill in Toucans, but on the other hand there is a fairly definite correspondence between the colors of the bill in the living bird and in preserved specimens. One has only to handle series of specimens of the various species in this family, and to compare the colors of their bills with those given on the labels, to discover that this is true. Once this fact has been recognized, the allocation of specimens of allied forms is simplified. Black in life is always black in the skin; orange yellow (as in *Ramphastos swainsoni*) changes to dull greenish yellow; and maroon to a dull tawny olive.

Mr. de Schauensee states that "von Sneider's color notes reveal no difference in the bill colors between the two forms" under discussion; consequently there remains no reason for transferring Swainson's name from one to the other. With his statement that such a shift is to be deplored, and to be avoided at all hazards, I agree perfectly, but the

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several editions of the A. O. U. Check-List bear testimony to the frequency of these disturbing changes. But with his statement that "the bill colors of the two forms are the same" I cannot at all agree. Certainly, they are different and sufficiently distinctive and constant in the dry skins before me, and the color notes quoted from von Sneider's labels are not quite convincing. In the case of the smaller Pacific coast bird Carriker has underscored the word "black" in describing the color of the bill, while in the case of the larger bird he calls it "blackish maroon" or "reddish black." In the latter the dark area of the bill (in the skin) is obviously lighter-colored than in the Pacific coast bird (in one specimen it is surprisingly close to that shown in *R. swainsoni*).

It is true, as de Schauensee admits, that neither of the two forms in question "correspond[s] absolutely to Swainson's plate," but I still insist that the small, black-billed bird of the Pacific coast of Colombia agrees much better, so far as color is concerned, with this figure than does the larger form of the interior. However, there is another consideration which has been overlooked: the shape of the bill. *Ramphastos ambiguus brevis* (as de Schauensee now calls it), besides being smaller in all dimensions than *R. a. ambiguus*, has a differently shaped bill. As pointed out by Chapman (Bull. Am. Mus. Nat. Hist., 36, 1917, 329), the Pacific coast bird has a bill in which the "keel" of the culmen shows to its base. What is even more significant, the commissure is an almost uniform arc of a circle, whereas in *ambiguus* it is very nearly straight basally for one-third to one-half of its length. It requires only a momentary comparison with Swainson's plate to discover that insofar as this feature is concerned it corresponds with the larger interior form. Mainly on this ground I am prepared to follow de Schauensee in relegating my *innominatus* to synonymy without serious misgivings, despite the disagreement in bill-pattern with Swainson's figure.

As to the status of *abbreviatus*, however, I am not so sure. Our specimen from El Hacha, a locality on the railroad about 35 miles west of Puerto Cabello, has its counterpart in the Rohl specimen from near Guatire, which lies about 12 miles east of Caracas. The two are precisely alike; they differ from Colombian specimens in their somewhat smaller size—the bill in particular—and in having the dark area on the mandible and the base of the maxilla obviously more blackish. (I have already cited the colors of these parts as given by the collector for the El Hacha skin.) To me this suggests that the bird of the north coast of Venezuela may be subspecifically separable under the name *abbreviatus*—unless indeed, as is quite possible, the colored drawing which is the basis of Swainson's name *ambiguus* was made from a bird taken in this very region.

My revised conclusions in the present case, therefore, are the same as de Schauensee's, except on one point: I agree with Chapman that the Pacific coast bird should stand as a full species, *Ramphastos brevis*. I am not one of those who rank all allied forms as subspecies until and unless it can be shown that they occur together.

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THE RACES OF THE WHITE-THROATED FLY-
CATCHER WARBLER [*ABROSCOPUS SUPER-*
CILIARIAS (BLYTH)]

BY H. G. DEIGNAN¹

Through the kindness of the authorities of the Academy of Natural Sciences of Philadelphia, the American Museum of Natural History, the Chicago Natural History Museum, and the Museum of Comparative Zoology, I have been able to add to the series of the white-throated flycatcher warbler in the United States National Museum to make a grand total of 125 adult specimens.

Despite the long series brought together, it will be seen that the number of localities represented is extraordinarily small. This may be explained in part by the accidents of collecting, but also reflects the fact that this bird, as a *species* ranging so widely over the Indo-Chinese and Malaysian Subregions, is evidently wholly absent from extensive areas (*viz.*, eastern and southeastern Siam, Moyen- and Bas-Laos, Cambodia, Cochinchine), while common enough in others. The explanation of its discontinuous distribution will almost certainly prove to be connected with the distribution(s) of the one or more species of bamboo, with haulms neither too large nor too small in diameter, upon which the bird's year-round economy depends. Since the ornithological collector will rarely have the botanical knowledge to identify the bamboo(s) concerned, the problem's elucidation perhaps lies far in the future; it may be noted here, however, that, in northern Siam, several of my own specimens are known to have been taken in the great brakes of "mai bong" (*Bambusa tulda*) that are frequent, especially in the more eastern provinces.

Under the circumstances, it is not surprising that a number of local races should have developed, although the subspecific characters are sometimes so subtle that they cannot readily be perceived in limited material. In my series, variation appears in the color tones of pileum, mantle, and abdomen, in the degree of development of a white mesial area on the abdomen, and in length of wing (without regard to sex). General coloration tends to become duller and paler with wear, but seems not to alter appreciably with age of specimen.

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1. *Abroscopus superciliaris albigularis* (Blyth)

Abornis albigularis "Jerd. & Blyth" Blyth, Proc. Zool. Soc. London for 1861, pt. 2, Aug. 1861, p. 200 (Sikkim).

Abornis flaviventris Jerdon, Birds of India, vol. 2, pt. 1, 1863, p. 203 (Darjiling, Bengal). New name for *Abornis albigularis* "Jerd. & Blyth" Blyth 1861 (Sikkim), considered invalidated by *Abornis albo-gularis* "Hodgson" Moore 1854.

Abornis griseofrons J. E. and G. R. Gray, Catalogue of the specimens and drawings of Mammals, Birds, Reptiles, and Fishes of Nepal and Tibet, presented by B. H. Hodgson, Esq., to the British Museum, ed. 2, 1863, p. 33 (no locality given; type specimens from Nepal, *file* Bowdler Sharpe, Catalogue of the Birds in the British Museum, vol. 4, 1879, p. 403).

Diagnosis.—The sinciput dark brownish gray, more or less washed with olive-green, and not clearly demarcated from the oily olive green of the occiput, nape, and mantle; the feathers of the lower back broadly tipped with yellow to form a conspicuous rump band; the chin, throat, and uppermost breast white; the remaining underparts canary yellow, with a tendency toward a mesial area of white on the abdomen; the remiges blackish, narrowly edged with oily olive-green along the outer web; the rectrices brown, edged along the outer web with oily olive-green, along the inner web with fawn.

Wing length.—45-52 mm. (11).

Specimens examined.—SIKKIM: no definite locality (4 unsexed); BENGAL: Darjiling District: Darjiling (1 unsexed); ASSAM: Cachar District: Gunjong (2 males, 3 females), Dihunji (1 female).

Remarks.—The population of northern Cachar are, of course, not quite like topotypes of this race, but on average characters belong here rather than with the following form.

2. *Abroscopus superciliaris drasticus*, subsp. nov.

Type.—U. S. National Museum No. 265060, adult female, collected at Margherita, Lakhimpur District, Assam Province, India, on November 26, 1903, by Henry Neville Coltart (original number 4407).

Diagnosis.—Similar to *A. s. albigularis* of Sikkim, but with the whole crown dark brownish gray, scarcely washed with olive green, and much more clearly demarcated from the color of the remaining upperparts; the nape and mantle oily olive-green, strongly suffused with golden, to give a very different general coloration; the yellow of the rump band and the posterior underparts more golden.

Wing length.—42-50 mm. (14).

Specimens examined.—ASSAM: Lakhimpur District: Margherita (2 males, 7 females, 1 unsexed); BURMA: Upper Chindwin District: Tawmaw (1 male), Hai Bum (1 male), Nanyaseik (1 female); SIAM: Southwestern Siam: 40 mi. E. of Ban Um Phang (1 unsexed).

Remarks.—The bird from southwestern Siam, almost a topotype of *A. s. superciliaris*, is so distinct from 39 specimens of *superciliaris* and matches so exactly the most highly colored examples of *drasticus*, that I am compelled to list it here. It was collected on February 9, 1924, and might be considered a winter straggler.

3. *Abroscopus superciliaris smythiesi*, subsp. nov.

Type.—Academy of Natural Sciences of Philadelphia No. 137723, adult female, collected at Dudaw Taung, elev. 2,133 ft., Pakokku District, Magwe Division, Burma, on February 8, 1938, by Gerd Heinrich (original number 1393).

Diagnosis.—Similar to *A. s. albigularis* of Sikkim, but with the occiput and vertex a paler and much less brownish gray, slightly washed with olive green, and much more clearly demarcated from the color of the remaining upperparts; the occiput, nape, and mantle a paler and purer olive-green; the yellow of the rump band and the posterior underparts a paler canary yellow, this effect heightened below by the strong tendency toward an extensive mesial area of white on the abdomen.

Wing length.—46.52 mm. (16).

Specimens examined.—BURMA: Pakokku District; Dudaw Taung (6 males, 4 females, 4 unsexed); Thayetmyo District: no definite locality (1 male, 1 unsexed).

Remarks.—This is almost certainly the race represented by Ticehurst's single specimen from the Prome District (next south of the Thayetmyo District) which "does not quite match *flaviventris* [= *albigularis*] or yet *superciliaris* as exemplified by series from the type localities" (Journ. Bombay Nat. Hist. Soc., vol. 34, 1931, p. 909).

The new form is named for Bertram Evelyn Smythies, author of "Birds of Burma."

4. *Abroscopus superciliaris superciliaris* (Blyth)

Abornis superciliaris "Tickell" Blyth, Journ. Asiat. Soc. Bengal, vol. 28, 1859, p. 414 ("mountainous interior of the Tenasserim provinces"; type specimen from "Woods of Teewap'hado. 1100 feet," Amherst District, Tenasserim Division, Burma, *vide* Tickell, *ibid.*, p. 453).

Phyllopneste (Meyer). Subgen. *Phylloscopus* (Boié). *superciliaris* "(mihi)" Tickell, Journ. Asiat. Soc. Bengal, vol. 28, 1859 [= 1860], p. 453 ("Woods of Teewap'hado. 1100 feet," Amherst District, Tenasserim Division, Burma).

A [brornis]. *superciliaris salwinensis* Stuart Baker, Bull. Brit. Orn. Club, vol. 44, Mar. 4, 1924, p. 62 (Salween District, Tenasserim Division, Burma).

Abroscopus superciliaris contii Meyer de Schauensee, Proc. Acad. Nat. Sci. Philadelphia, vol. 98, July 10, 1946, p. 118 (Mong Len, Keng Tung State, Southern Shan States, Burma).

Diagnosis.—Similar to *A. s. albigularis* of Sikkim, but with the whole crown dark gray, almost without brownish tinge, scarcely washed with olive green, and much more clearly demarcated from the color of the remaining upperparts; the nape and mantle a purer, less oily, olive-green.

From *A. s. drasticus*, separable by the purer gray of the crown, the much purer olive-green of the upperparts, and the less golden yellow of the rump and posterior underparts.

From *A. s. smythiesi*, separable by the deeper and more extensive gray of the crown, the deeper olive green of the upperparts, and by the virtual absence of a white mesial area from the abdomen.

Wing length.—44.52 mm. (39).

Specimens examined.—BURMA: Myitkyina District: Myitkyina (1 male), Namaoyang (1 unsexed); Bhamo District: Mongwai (1 female); Keng Tung State: Mong Len (2 females, including type of *contii*); LAOS: Haut-Mékong Province: Nam Khueng (1 unsexed), Lo tiao (5 males, 8 females, 1 unsexed); Luang Prabang State: Taloun (2 males, 1 female); SIAM: North: Ban Nong Thong (1 unsexed), Ban Mae Tak (1 male), Ban Na Noi (1 female), Doi Mon Khwam Long (1 male), Doi Khun Tan (1 male), Doi San Ho (1 male), Doi San Pa Bong (1 unsexed), Muang Lom Sak (2 males, 2 females); Southwest: Ban Si Sawat (2 males, 3 females).

Remarks.—*A. s. salwinensis* was named under the mistaken impression that *A. s. superciliaris* had been described from Sikkim. The author himself later found it impossible to distinguish between the populations of the contiguous districts of Amherst and Salween.

A. s. contii was named after comparison with *A. s. smythiesi*, believed to represent *flaviventris* [= *albigularis*], and a small series from southwestern Siam, practically tototypes of *superciliaris*. Like de Schauensee, I lack truly topotypical material of *salwinensis*, but the form of northwestern Siam is hardly likely to differ from that of the Salween District, immediately adjacent; thus, when the northwestern Siamese bird is found to be inseparable from the original series of *contii*, it follows that *contii* must almost certainly be a synonym of *salwinensis*, which is, itself, a synonym of *superciliaris*.

The distinctions in color of the crown and upperparts relied upon by de Schauensee for separating the more northern birds from those of southwestern Siam and neighboring Tenasserim seem to me to represent only the differences between fresh plumaged winter (February 13) birds from the Shan States and worn summer (June 30-July 14) examples from southwestern Siam. The sullied white of the throat given as a character of *contii* appears in individuals of any race; it would appear to result from imperfect cleansing of blood or buccal discharges from the feathers—certainly it is associated in a majority of cases with head wounds.

The fine series from the parts of Laos adjoining northern Siam have the upperparts averaging very slightly darker, thus showing approach to the following form; they are, nevertheless, racially inseparable from *superciliaris*.

The four fresh-plumaged birds from Muang Lom Sak (Wat Pa) have the mantle more suffused with golden than any others of the series; coming from the most southeastern locality of all, they may belong to, or show approach to, a race of the eastern Siamese plateau, although the species is not yet known to occur there. For the present they may be called *superciliaris*.

5. *Abroscopus superciliaris euthymus*, subsp. nov.

Type.—American Museum of Natural History No. 290584, adult, male, collected at Pakha, elev. 3,281 ft., Laokay Province, Tongking, on December 23, 1929, by Jean Delacour and Pierre Jabouille.

Diagnosis.—Similar to *A. s. albigularis* of Sikkim, but with the whole crown dark gray, scarcely washed with olive-green, and much more clearly

demarcated from the color of the remaining upperparts; the nape and mantle deep olive-green, darker than in any other race outside the Malaysian Subregion.

From *A. s. superciliaris*, separable by the deeper gray of the crown and the darker olive-green of the upperparts.

Wing length.—45-52 mm. (16).

Specimens examined.—LAOS: 5° Territoire Militaire: Phong Saly (3 males, 2 females); TONGKING: Laichau Province: 37.5 mi. ENE. of Phong Saly (1 male, 1 female), Muong Moun (1 male), Muong Boum (1 male, 1 female); Laokay Province: Ban Nam Nhung (1 male), Ban Nam Da (2 males, 1 female), Pakha (1 male, 1 female).

Remarks.—Delacour has identified all populations from Indochine (Tongking, Laos, and Annam) as inseparable from *A. s. schwaneri* of Borneo. I have shown that two subspecies other than *schwaneri* occur in Laos and Tongking; specimens from southern Annam have not been seen, but it is very probable that still a third, perhaps undescribed, will be found there when good series are obtained.

6. *Abroscopus superciliaris schwaneri* (Blyth)

“*Abornis schwaneri* (Temm.)” Blyth, Ibis, ser. 2, vol. 6, Apr. 1870, p. 169 (“Borneo”; type specimen from Banjarmasin, South Borneo, *vide* Bowdler Sharpe, Catalogue of the Birds in the British Museum, vol. 4, 1879, p. 403).

Diagnosis.—Similar to *A. s. albigularis* of Sikkim, but with the whole crown dark brownish gray, scarcely washed with olive-green, and much more clearly demarcated from the color of the remaining upperparts; the nape and mantle deep olive-green.

From *A. s. euthymus*, separable by superior size (wing length: 51-56 mm., against 45-52 mm.) and, especially in fresh plumaged specimens, by the brownish cast to the dark gray of the crown.

Wing length.—52-55 mm., once 48 mm. (12); 51-56 mm. (5, *vide* Robinson and Boden Kloss, Journ. Nat. Hist. Soc. Siam, vol. 5, 1924, p. 243).

Specimens examined.—DUTCH BORNEO: Mount Tibang (1 male); SARAWAK: Mount Penrissen (1 male); BRITISH NORTH BORNEO: Mount Kinabalu (5 males, 1 female, 4 unsexed).

Remarks.—Since no specimens have been seen from anywhere near the type locality, I have been compelled to follow Finsch (Notes from the Leyden Museum, vol. 26, 1905, pp. 62-63) in the assumption that birds from the northern mountains are the same as those of the southern lowlands. Critical comparison of long series from North and South would be desirable.

7. *Abroscopus superciliaris bambusarum*, subsp. nov.

Type.—Academy of Natural Sciences of Philadelphia No. 127946, adult male, collected on Khao Phanom Bencha, peninsular Siam at lat. 8°15' N, long. 98°55' E, by collectors for Rodolphe Meyer de Schauensee (original number 44).

Diagnosis.—From *A. s. schwaneri*, as exemplified by specimens from northern Borneo, separable by having the crown a slightly paler brownish gray; the nape and mantle a still purer deep olive green, virtually free of oily or golden suffusion; and by inferior size (wing length: 45-51 mm., against 51-56 mm.).

From *A. s. euthymus*, separable only by the brownish cast to the dark gray of the crown and the still purer deep olive-green of the nape and mantle, virtually free of oily or golden suffusion.

From *A. s. superciliaris*, separable by the slightly darker grey of the crown and the much deeper olive-green of the nape and mantle.

Wing length.—49-51 mm. (2); mm. (14, *vide* Robinson and Boden Kloss, Journ. Nat. Hist. Soc. Siam, vol. 5, 1924, p. 243).

Specimens examined.—SIAM: Peninsula: Khao Phanom Bencha (2 males).

Remarks.—Robinson and Boden Kloss (*loc. cit.*) recognized the existence in the northern Malay Peninsula of a race differing from *schwaneri* in lesser size and pointed out, not quite correctly, that "there are no colour distinctions."

Stuart Baker (Fauna of British India, Birds, ed. 2, vol. 8, 1930, p. 644) observed that "the Southern Tenasserim bird seems to me to be nearer *schwaneri* than *superciliaris*. For the present I shall retain it under that name, though it may eventually have to be separated under yet another name as intermediate between the Northern and Bornean forms."

Chasen (Handlist of Malaysian Birds, 1935, p. 253, footnote 1) pointed out that "the birds I here call *A. s. superciliaris* are like *schwaneri* in colour but larger [*sic* = smaller]: they are therefore perhaps not true *superciliaris*, but intermediate, or an undescribed race."

A. s. bambusarum is in fact very distinct from *superciliaris*, but stands extraordinarily close to the geographically much more remote *euthymus*. It ranges from the type locality north at least as far as the Isthmus of Kra. A single specimen from Khao Soi Dao (lat. 7°20' N) cannot be distinguished from a series of *A. s. saikaiorum*.

8. *Abroscopus superciliaris saikaiorum* (Stresemann)

Abroscopus saikaiorum Stresemann, Bull. Brit. Orn. Club, vol. 31, Dec. 27, 1912, p. 27 (Upper Batang-Padang Valley [Cameron's Highlands], elev. 3,000 ft., Perak-Pahang Boundary, Malaya).

Diagnosis.—Similar to *A. s. schwaneri*, as exemplified by specimens from northern Borneo, but with the crown a slightly paler brownish gray; the nape and mantle a still purer deep olive-green, virtually free of oily or golden suffusion; the yellow rump band (when present) and the posterior underparts a paler canary yellow, this effect heightened by the strong tendency toward a fairly extensive mesial area of white on the abdomen.

From *A. s. bambusarum*, separable only by the presence of the white mesial area on the abdomen.

Wing length.—46-53 mm. (9); 50-55 mm. (11, *vide* Robinson and Boden Kloss, Journ. Nat. Hist. Soc. Siam, vol. 5, 1924, p. 243).

Specimens examined.—SIAM: Peninsula: Khao Soi Dao (1 male); MALAYA: Perak-Pahang Boundary: Telom (1 male); Selangor-Pahang Boundary: Semangko Pass (1 male, 1 female, 1 unsexed); Selangor: Ginting Bidei (2 males, 2 females).

Remarks.—*Abornis sakaiorum* was described from a unique specimen, which lacked "all trace of yellow on the underparts and of greenish on the upperparts." Stresemann himself later (Nov. Zool., vol. 27, 1920, p. 502) surmised that it represented a mere color variety of the Malayan race of *Abroscopus superciliaris*, which is known to be common at Cameron's Highlands. Until the contrary is shown to be the case, his name must be used.

Robinson and Boden Kloss (*loc. cit.*) found *sakaiorum* to have a longer wing than the form I have called *bambusarum*, but this distinction does not appear in my series.

9. *Abroscopus superciliaris papilio*, subsp. nov.

Type.—Academy of Natural Sciences of Philadelphia No. 140013, adult female, collected at Medan, Deli District, northern Sumatra, on May 19, 1939, by Sidney Dillon Ripley (original number 1031).

Diagnosis.—Similar to *A. s. schwaneri*, as exemplified by specimens from northern Borneo, but with the nape and mantle a still purer deep olive-green, virtually free of oily or golden suffusion; the yellow of the rump band (rarely present) and the posterior underparts a paler canary yellow, this effect heightened by the great development of the white mesial area on the abdomen.

From *A. s. sakaiorum*, separable by the other deeper brownish gray of the crown; the darker olive-green of the nape and mantle; and the greater extent of the white mesial area on the abdomen.

From *A. s. bambusarum*, separable by the rather darker brownish gray of the crown; the deeper olive-green of the nape and mantle; the presence of an extensive white mesial area on the abdomen; and by greater size (wing length: 53-54 mm., against 45-51 mm.).

....Wing length.—53-54 mm. (2).

Specimens examined.—SUMATRA: North: Mount Korinchi (1 male), Medan (1 female).

Remarks.—It is admittedly rash to name a race of this species on but two specimens. The Sumatran birds seen, however, do not agree with any of the form discussed above, and since this warbler has now been shown to exhibit racial variation in all other areas where such might be expected to occur, it would be very astonishing if the Sumatran populations were not also distinct.

10. *Abroscopus superciliaris vordermani* (Büttikofer)

Cryptolopha Vordermani Büttikofer, Notes from the Leyden Museum, vol. 15, Note 36, July 1893, p. 260 (East Java; type specimen from the Ijang Mountains, near Banjuwangi, Besuki Residency, East Java, *vide* Junge, in *epist.* of Nov. 26, 1946).

Diagnosis.—Similar to *A. s. schwaneri*, as exemplified by specimens from northern Borneo, but with only the sinciput dark brownish gray,

this part not clearly demarcated from the dull olive-green of the occiput, nape, and mantle; the rump band (rarely present) and the posterior underparts dull creamy yellow, with a great development of the white mesial area on the abdomen.

From all other races, equally readily separable by the washed-out colors of the upperparts and underparts.

Wing length.—51-54 mm. (3).

Specimens examined.—JAVA: West: Mount Gedeh (2 males), Mount Guntur (2 unsexed).

Remarks.—The original description of this race is very misleading: Büttikofer's unique specimen was said to have the upperparts "lively yellowish green" and the posterior under surface "bright yellow." Dr. G. C. A. Junge of the Rijksmuseum at Leiden has courteously examined the type for me, and writes that these parts are, in fact, as described above.

The four examples before me from West Java have the upperparts a dull olivaceous-brown, washed with fulvous on the rump, and thus do not agree with the type. While for the present I place them under Büttikofer's name, there is a possibility that in West Java (and southern Sumatra?) we shall find a race distinct from *vordermani* of East Java.



April 3, 1947

BIOLOGICAL SOCIETY OF WASHINGTON

NEW SPECIES OF PARROT AND RACE OF QUAIL
FROM MEXICOBY ROBERT T. MOORE¹

A recent collecting trip by Chester C. Lamb to Sierra Potosí in central-west Nuevo León resulted in the discovery of an unusual new species of parrot, which is herewith described:

Rhynchopsitta terrisi,² sp. nov.

Maroon-fronted Parrot

Type.— Male adult in worn breeding plumage (sex organs enlarged); number 42495, collection of Robert T. Moore; Sierra Potosí, Nuevo León, Mexico; altitude about 7500 feet; July 8, 1946; collected by Chester C. Lamb.

Specific characters.— Although differing markedly both in pattern and coloration from *Rhynchopsitta pachyrhyncha* (Swainson), it is nearest to that species, differing in lacking entirely the large yellow patch on the under primary coverts, which, instead, is dark brownish gray with an olive cast; forehead and superciliary region entirely different—Hay's Maroon³ to Hay's Brown instead of poppy red, not extending posteriorly so far on crown; anterior lesser wing coverts much darker red, between Carmine and Ox-Blood Red; small area in front of bare orbital space same color as forehead; red on carpo-metacarpal region much darker, about Garnet Brown; the entire green of upper and under parts very much darker, about Cosse Green, iridescent; size considerably larger, are much darker, about Cosse Green, iridescent; size considerably larger, about fifteen percent in wing, twelve percent in tarsus and toes and somewhat less in other measurements. The sexes are the same, except for slightly smaller size in the females.

Range.— Known only from two areas in the Sierra Madre de Occidental in central-west Nuevo León, namely, the Sierra Potosí at about 7500 feet and another area at 6000 feet elevation, approximately six miles south-east of Galeana, Nuevo León.

Measurements.— Average of three males: Wing 288.8, Tail 190.5, Exposed Culmen 42.0, Tarsus 23.6 millimeters. One female: Wing, 283.4, Tail 189.1, Exposed Culmen 41.0, Tarsus 22.6 millimeters.

Specimens examined.— *terrisi*—Nuevo León: Sierra Potosí 1 ♂ (type), 1 ♀ (July 8); 6 mi. southeast Galeana 2 ♂ (July 21); *pachyrhyncha*—southwest Chihuahua: Laguna Juanota ♂, Mt. Mohinora 1 ♂ 2 ♀, Los Frailes 2 ♂; Michoacán: Rancho La Cofradia 1 ♂—all in Moore Collections.

¹Contribution from the California Institute of Technology, Pasadena, California.

²Named for Terris Moore, President, Board of Trustees, New England Museum of Natural History, as a token of appreciation of his indomitable will to overcome all obstacles, which made a success of our difficult zoological expedition and resulted in the discovery of *Tephrophilus wetmorei* and the first ascent of Mt. Sangay.

³Names of colors, when capitalized, are taken from Ridgway's "Color Standards and Color Nomenclature," 1912.

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Remarks.— Although this species has the generic characters of the genus *Rhynchopsitta*, it differs decidedly from *Rhynchopsitta pachyrhyncha* in coloration and has a different color pattern, lacking entirely the least suggestion of the large yellow patch of the under wing or the spot of color, different from the forehead, in front of the bare orbital space, so characteristic of *pachyrhyncha*.

The male type had the sex organs fully enlarged, as well as one of the males taken at a collecting station six miles southeast of Galeana, Nuevo León.

For some time I have known that the range of *Lophortyx gambelii* extends much farther south than has been mentioned in literature, reaching latitude 25° and almost to the vicinity of Culiacán, the capital of the state of Sinaloa. There is now in the Moore Collection an adequate number of specimens taken south of the Rio Sinaloa, to indicate that the birds south of this river represent an undescribed, terminal race, to which I herewith give a name:

***Lophortyx gambelii friedmanni*,⁴ subsp. nov.**

Sinaloa Quail

Type.— Male adult; number 8769, Collection of Robert T. Moore; Reforma, Sinaloa, Mexico; sea level, April 13, 1934, collected by Chester C. Lamb.

Subspecific characters.— Nearest to *Lophortyx gambelii fulvipectus* (Nelson) of southwestern Sonora, but differs from it in having the forehead with much fewer streaks of white, this area in some individuals being pure black; Hessian Brown streaks on nape and sides of neck more conspicuous; large patch on upper abdomen darker, being Warm Buff instead of Light Buff; streaks on under tail-coverts considerably darker and browner, being definitely dark brown instead of gray slate color; middle of back darker, more olive-brown, instead of gray with a faint tinge of olive. It differs from true *gambelii* of southern United States in the same characters but to a greater degree and is a darker bird than *fulvipectus*, instead of much paler as is true of *pembertoni* of Tiburón Island, Sonora.

Two birds from near Thome in extreme northeastern Sinaloa just south of the Rio Fuerte, seem to be intergrades with *fulvipectus*, but nearer to *friedmanni*; one of these birds has an almost pure black forehead.

Range.— Entirely in the Sinaloa Coastal Faunal District of Sinaloa from Reforma in the south and probably from the Culiacán River north to the Rio Fuerte.

Specimens examined.— *friedmanni*—Sinaloa: 8 ♂ 2 ♀; *fulvipectus*—southwestern Sonora: 6 ♂ 2 ♀—all in Moore Collections; also all the specimens in the Dickey Collection, University of California at Los Angeles; *gambelii*—southern Arizona: Fresnal 2 ♂ 1 ♀—in Moore Collections; also a large series in eastern museums, not all compared at the same time.

Remarks.— The habitat of this form covers part of the Lower Arid Tropical Zone of Sinaloa, which, however, has considerably more annual rainfall than that of southwestern Sonora, the habitat of *fulvipectus*. The rainfall in this area averages nearly twenty inches annually, instead of about three to ten inches in southwestern Sonora. The females differ in the same characters as the males, but the foreheads are almost solid brown instead of streaked gray and brown and the lower throat is darker.

⁴I take great pleasure in naming this new form for Dr. Herbert Friedmann, Curator of Birds of the United States National Museum, as a tribute to the work he has done on the genus *Lophortyx*.



April 3, 1947

BIOLOGICAL SOCIETY OF WASHINGTON

NEW RECORDS FOR *ORYZOMYS PALUSTRIS* PALUSTRIS (HARLAN) AND *ACARISCUS MASONI* EWINGDONALD S. FARNER¹

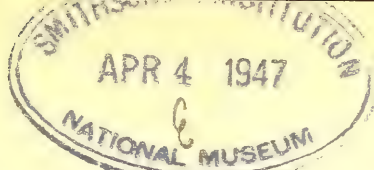
In the course of developing field methods for use with the United States of America Typhus Commission, Mr. J. A. Robar, then Pharmacist's Mate, USNR, assigned to the U. S. A. Typhus Commission, with Mr. Watson M. Perrygo, U. S. National Museum, collected in the vicinity of Washington, D. C., a number of vertebrate animals for examination for ectoparasites. Among these vertebrate specimens were a juvenile male and a juvenile female rice rat, *Oryzomys palustris palustris* (Harlan), collected two miles northwest of Oxon Hill, Prince George's County, Maryland, 9 August 1946 (U. S. National Museum Nos. 282181 and 282182). These were identified by Dr. Remington Kellogg, Division of Mammals, United States National Museum. Apparently these specimens constitute the second record of the occurrence of rice rats in Maryland, five specimens having been reported by A. H. Howell (1927) as taken 7 January 1927 Nanjemoy Creek, Charles County, thirty miles southwest of Oxon Hill. Rice rats have been reported also from northern Delaware by Schantz (1943, p. 104) and Ulmer (1944). Also the species has been recorded, in addition to the type of locality, from several other localities in southern New Jersey by Rhoads (1903, p. 84), Stone (1907, p. 74), and Goldman (1918, p. 24). The records cited above appear to indicate the northward limit of occurrence of rice rats in the tidewater area of eastern United States. The rice rats taken at Oxon Hill have additional interest in the four larval trombiculid mites which were removed from them. These chiggers, although they vary somewhat among themselves and somewhat from other specimens of this species which I have examined, seem nevertheless

¹Lieutenant H. (S) USNR attached to the U. S. A. Typhus Commission. Now at Museum of Natural History, University of Kansas.

to be definitely referable to *Acariscus masoni* Ewing. They have been examined by Dr. H. E. Ewing, formerly of the U. S. Department of Agriculture, and Dr. George W. Wharton, Department of Zoology, Duke University, who concur in the identification. With the exception of the 10 specimens reported by Ewing (1943, p. 61) from *Microtus pennsylvanicus pennsylvanicus* (Ord) taken in Massachusetts all previously published records of this chigger have been from South Carolina, Georgia, and Florida. It has not previously been reported from rice rats although it would seem likely that farther south it would commonly parasitize them. The specimens of *Acariscus masoni* on which this report is based are deposited in the collection of the United States National Museum.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW OWLS OF THE GENERA *OTUS* AND
GLAUCIDIUM

BY ROBERT T. MOORE¹

When the author described *Otus vinaceus seductus* (Proc. Biol. Soc. Wash., 54, 1941, 156) from Michoacán, obviously a connecting link between the *Otus vinaceus* and the *Otus cooperi* groups, he suspected there might be an undescribed form of *Otus cooperi* in southern Mexico, bridging the gap between them. Consequently, when the indefatigable efforts of Mario del Toro Avilés resulted in the securing of two specimens at Mazatán, Chiapas, on the Pacific Coast near the border of Guatemala, it was no surprise that they represented the anticipated link between the two groups, which is herewith described:

Otus cooperi chiapensis, subsp. nov.

Chiapas Cooper's Owl

Type.—Male adult, number 37469, collection of Robert T. Moore; Mazatán, Chiapas, near sea level; June 29, 1943; collected by Mario del Toro Avilés.

Superspecific characters.—Although possessing characters of the *Otus vinaceus* group, it is nearest to *Otus cooperi* (Ridgway), differing in (1) having the sides and the upper breast marked with Amber Brown² blotches, divided by a black streak; (2) the lighter portions of the bars across the rectrices much darker, more uniform with the darker portions of tail; (3) the pairs of light buff spots on each side of the black streaks on the upper parts more indistinct and hardly discernible; (4) the under wing coverts less heavily marked with hastate or rhombus-shaped brown spots—all of the above-mentioned characters resembling similar ones of the *vinaceus* group. It differs from both *O. cooperi* and *O. vinaceus seductus* (the nearest forms geographically to the south and the north respectively) in (5) having the alternating dark and light quadrate spots on the outer webs of the primaries much nearer the same color and not so sharply contrasted with each other; (6) the brown band of blotches posterior to the auricular area (so called nuchal collar) non-existent, or nearly so; (7) the sides of face and the whole area posterior to the auricular area, the pileum, particularly the lateral mar-

¹Contribution from the California Institute of Technology, Pasadena, Calif.

²Names of colors in this paper, when capitalized, are taken from Ridgway's "Color Standards and Color Nomenclature," 1912.

gins and nape covered with a much greater amount of hoary whiteness, very different from the black-streaked-brown appearance in true *cooperi*; (8) the herring-bone cross-barring of the streaks of both upper and lower part (detectable in both the *cooperi* and *vinaceus* groups, and very conspicuous in the *Otus asio* group, especially *O. a. sortilegus* of Jalisco) almost completely non-existent. However, it has the other characters of *cooperi*, not possessed by the *vinaceus* group (with the exception of *O. v. seductus*, which approximates some of them), strongly marked, such as the completely unfeathered and merely bristled toes (approached by *seductus*); the narrower black streaks on the under parts; the browner (more reddish) general coloration of the upper parts; the more vinaceous (Pinkish Cinnamon) tone of the tiny dots over practically all the under parts; the very pale grayish brown auricular area and the bars across the tail being inverted V-shaped instead of horizontal, and the tail less than half the length of the wing. The eyes are given by the collector as yellow.

Range.—Known only from the male and female specimens in the Moore Collection, taken at Mazatán, Chiapas, near the Pacific Ocean in the Arid Tropical Zone of the Tehuantepec Biotic Province. However, a re examination of the specimen reported as *cooperi* by the authors of the Biología Centrali-Americana (Aves, 3, 20) from Cocoprieto on the Isthmus of Tehuantepec, may prove that *chiapensis* is also found in the same zone in the state of Oaxaca.

Measurements.—Male (type): Wing 175.8, Tail 85.8, Middle toe minus claw 17.4 millimeters, and female: Wing 172.5, Tail 88.1, Middle toe minus claw 15.8 millimeters.

Specimens examined.—*Chiapensis*—Chiapas: Mazatán 1 ♂ 1 ♀ (June). *seductus*—Michoacán: near Apatzingán 1 ♂ (Type), Chinapa 1 ♂. *O. v. vinaceus*—Sinaloa: 1 ♂ 1 ♀; Chihuahua: Durasno 1 ♀ (Type). *O. vinaceus sinaloensis*—Sinaloa: 1 ♂ (Type, breeding); Sonora: 6 specs. *O. asio sortilegus*—Jalisco: near Atoyac 1 ♂ 1 ♀ (Type, breeding). *O. asio suttoni*—8 specs. from Aguascalientes to Durango. *cooperi*—Costa Rica: Esparta 1 ♂ 2 ♀ ad.

Remarks.—Since the description above emphasizes the differences between the *vinaceus* and the *cooperi* groups by pointing out the resemblance of *chiapensis* to one or the other, it is necessary to re-state here (see "Three New Races in the Genus *Otus* from Central Mexico," Proc. Biol. Soc. Wash., 54, 1941, pp. 158-159) the characters which the *vinaceus* and *cooperi* groups have in common, which are lacking in the *Otus asio* group: (1) the peculiar vermiculation consisting of very fine dots on almost all of the under parts, generally referred to as vinaceous, but which grows deeper in tone (towards Pinkish Cinnamon) as we proceed south from true *vinaceus* of southwestern Chihuahua to *O. v. seductus* of Michoacán and thence to *chiapensis* of Chiapas and true *cooperi* of Costa Rica; (2) medium large toes and feet—smaller than those of the *guatemalae* group, but larger than those of the *Otus asio* group; (3) the toes much less covered with true feathers than in the *Otus asio* group, showing less feathering as we proceed south and with no feathers whatever (only bristles) in *chiapensis* and true *cooperi*; (4) size becoming larger as we proceed south, but the largest form of all being *O. vinaceus seductus* of Michoacán.

Aside from the above considerations of intrinsic characters, another

reason for detaching the *vinaceus* group from the *asio* group, is the occurrence of a characteristic race of the *asio* group, namely *sortilegus*, showing no approach whatever to the *vinaceus* group, yet occurring right in the middle of the general range of the *vinaceus-cooperi* groups, namely, in central Jalisco.

Only the male type of *chiapensis* has the blotches of Amber Brown divided by a black streak, the female possessing only a vestigial remnant of this character.

The accretion of thirteen new specimens of the rare species, *Glaucidium minutissimum* from the states of Nayarit, Jalisco, Guerrero and Morelos, has permitted a slight revision of the range of *Glaucidium minutissimum oberholseri* and the description of a new form from northern Guerrero and Morelos:

***Glaucidium minutissimum griscomi*,³ subsp. nov.**

Balsas Pygmy Owl

Type.—Male adult with sex organs enlarged, number 28814, collection of Robert T. Moore; El Rancho Protrero de los Indios, 12 miles south of Zirandaro, Guerrero, Mexico; altitude 1,200 feet; May 31, 1941; collected by Chester C. Lamb.

Subspecific characters.—Nearest in the gray phase to the same phase of *Glaucidium minutissimum oberholseri* Moore of the mountains of central Sinaloa but differing in having (1) back and scapulars much grayer; (2) wing-coverts and primaries paler; (3) spots on pileum and region posterior to auricular area more numerous; (4) nuchal color across upper back not so prominently marked with white; (5) upper tail coverts paler brown (paler than the dark portion of middle rectrices, instead of the same color as in *oberholseri*); (6) size larger, 11% in tail; (7) white spots on three outer rectrices averaging larger. It differs in the same way from the gray phase of the nearest form geographically, *Glaucidium minutissimum palmarum* of Nayarit, except for size, but to a far greater extent, all of the brown areas both above and below being very much grayer (duller brown) as compared with the rusty brown color of these areas in *palmarum*. The females differ in the same way.

Range.—Arid Lower Tropical Zone of the Rio Balsas Valley, one hundred miles from the Pacific Ocean near Zirandaro and also to the same zone at Xicatlacotla, Morelos, approximately one hundred twenty miles to the east.

Average Measurements in mm. of *Glaucidium minutissimum griscomi*, *oberholseri* and *palmarum*.

Males	Wing	Tail
4 ads. (incl. Type) <i>griscomi</i>	86. (84.2-88.1)	56.7 (55.7-57.5)
5 ads. (incl. Type) <i>oberholseri</i>	80.7 (79.3-82.0)	51.0 (48.6-53.1)
7 ads. <i>palmarum</i>	82.9 (80.0-84.9)	53.8 (52.3-55.9)
Females		
1 <i>griscomi</i>	85.6	56.8
0 <i>oberholseri</i>		
2 <i>palmarum</i> (incl. Type)	85.3 (83.2-87.3)	56.2 (54.5-57.9)

³Named in honor of Mr. Ludlow Griscom in appreciation of his excellent review of this species and clear interpretation of the relationships of the various forms.

Specimens examined.—*griscomi*, Guerrero: El Rancho Protrero 2 ♂ 1 ♀ (incl. Type), Morelos: Xicatlacotla 2 ♂. *oberholseri*, Sinaloa: Vado Hondo 1 ♂ (Type), Sierra Palos Dulces 3 ♂. *palmarum*, Nayarit: Chacala 2 ♂, Rancho Moloti 1 ♂, Sauta 1 ♂ 1 ♀, Arroyo de Juan Sanchez 1 ♀ (Type); Guerrero: Chilpancingo 1 ♂, El Naranjo 1 ♂. Intergrades *oberholseri* × *palmarum*, but nearer *palmarum*, Sinaloa: Rancho Santa Barbara 1 ♂ 1 im. ♀, Carrizo 1 ♂ 1 ♀. Intergrades nearer *oberholseri*, high mountains of Nayarit: 10 miles northwest from Santa Teresa 5,500 ft. 1 ♂.

Remarks.—The addition to the Moore Collection of this large number of new specimens of this species, always considered very rare, has made it advisable to give a new name to the form of the Lower Arid Tropical Rio Balsas Valley, extending into the state of Morelos, and, furthermore, has necessitated the revision of the range of *oberholseri*. At the time *oberholseri* was described (Proc. Biol. Soc. Wash., 1937, 103-106) the only specimen known from the type locality of *palmarum* on the sea coast just south of San Blas, Nayarit, was the Type itself. This new collection provides five specimens all from within a few miles of the type locality and proves that the type of *palmarum* is not uniform with this new series, although they confirm all of the characters given in the original description of *oberholseri* except one minor one, *e.g.* the alleged large area of white on the throat in *oberholseri* which is equally characteristic of this series of *palmarum*. They also reveal that specimens, formerly considered to be *oberholseri* from Rancho Santa Barbara and Rancho Picacho in the lower mountains of extreme southeastern Sinaloa, which, at the time were perceived not to be typical, are intergrades between *oberholseri* and *palmarum*, but nearer *palmarum*. These were cited in the original description as *oberholseri*. The change eliminates the one male from Rancho Santa Barbara and the immature female from Rancho Picacho, so that today we have only four males of typical *oberholseri* (no females), except for one male from the intergrading area. Therefore, the range of *oberholseri* is now restricted to the Arid Upper Tropical Zone of the mountains of central Sinaloa between the altitude of 1,000 and 3,500 feet but reaching 5,500 feet in the intergrading area. The range of typical *palmarum* remains the same, *e.g.* confined to the Lower Humid Tropical Zone of Nayarit, extending south through the lower mountains to Chilpancingo, thence to Naranjo in extreme southeastern Guerrero.

Griscomi seems to occupy a still different zoological niche, that of the Lower Arid Tropical Zone of the very hot Rio Balsas Valley, extending east via its source streams into Morelos. *Griscomi* extends higher across the border of the Upper Arid Tropical Zone since the altitude of Xicatlacotla of Morelos is about 2,800 feet. This extraordinary extension to the east of the range of the species *minutissimum*, cuts across the range of *Glaucidium gnoma* and throws into question the proposed conspecificity of these two species. Still more convincing evidence in this same direction are two specimens of each species in the Moore Collection taken within a few miles of each other near Santa Teresa, Nayarit, and at the same approximate altitude between 5,500 and 6,000 feet. Neither one shows the slightest approach in characters to the other.

The above-mentioned specimen of the *minutissimum* group occurs in an area of intergradation between *oberholseri* and *palmarum*, which extends for about eighty miles at the medium altitudes between Rancho

Santa Barbara, Sinaloa (2,500 feet) and Santa Teresa, Nayarit (5,500 feet). The Moore Collection has five specimens from four different localities in this area, three of these birds nearer to *palmarum* and two nearer to *oberholseri*, so that it is a "toss-up" which name should be given them. A larger series from the same area might well group these birds with *oberholseri* rather than with *palmarum*, which would be anticipated by the relatively high altitude at which they were taken.

Considered as a whole, there are only two known phases of this species of Pygmy Owl—the gray and what in other owls would be called the intermediate—the gray predominating in *griscomi*, in which race no specimen can truly be called intermediate. Of the four specimens of *oberholseri* only one is in the intermediate phase and this individual has about the same depth of color as the gray phase of *palmarum*. Of the nineteen specimens of the species in the Moore Collection, only four represent the intermediate phase, one in typical *oberholseri*, two in typical *palmarum* and one from the area of intergradation in the mountains.

Apparently, all three of these races breed in the month of May for we have May specimens in breeding condition of all three. In the case of *griscomi*, a female, number 28813, was collected on May 31, 1941 and contained large eggs. In other words, we have proof of *palmarum* breeding at sea level, of *oberholseri* in the Sierra Palos Dulces, central Sinaloa at 3,500 feet and of *griscomi* near Zirandaro, Guerrero at 1,200 feet. The iris of *griscomi* is reported by the collector as yellow.



PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW CRICKET FROG (*ACRIS*) FROM THE MIDDLE
WESTERN STATES

By FRANCIS HARPER

The Cricket Frog of the Interior Plains and Interior Highlands¹ of the United States seems to be amply entitled to recognition as a distinct subspecies.

Acris gryllus blanchardi, subsp. nov.

Western Cricket Frog; Blanchard's Cricket Frog

Type.—Carnegie Museum, No. 26,607; adult male; meadow near Smallen's Cave, Ozark, Christian County, Missouri; collected June 9, 1938, by Charles E. Mohr.

Subspecific characters.—Distinguished from the nearest geographical representative, *A. g. crepitans* Baird, by slightly greater linear measurements, by decidedly greater bulk, by somewhat more extensive webbing of the toes, and by the more extensive dusky area on the posterior face of the femora in the vicinity of the vent.

Description of type.—A few slight dermal tubercles on head, back, and hind limbs; outline of snout from below somewhat rounded, as in *A. g. crepitans*, not pointed, as in *A. g. gryllus* (Le Conte); tympanum small and indistinct; fingers not webbed; toes well webbed, the webbing extending to the proximal portion of the penultimate phalanx of the fourth toe; third toe extending past middle of antepenultimate phalanx of the fourth toe; two conspicuous metatarsal tubercles, unpigmented, the inner twice the size of the outer; pectoral fold present; areolae on chest and abdomen.

General color of upper parts (in preserved specimen) slaty gray; a triangular interorbital spot somewhat darker, its posterior apex not sharply pointed; upper labial region also darker, with four light vertical bars on each side; an oblique light line from eye to arm insertion, bordered behind by a small triangular dark patch; an oblique dark stripe extending from above axilla nearly to groin; several indistinct dark patches on lower back, two of them paired; no median light line over urostyle; dorsal surface of femur with about three dark transverse elliptical bars, the middle one darkest; tibia, tarsus, toes, and arms with dusky spots or bars above; a dark brown stripe on posterior surface of femur, bordered on each side (except in vicinity of vent) by a straw-colored area; a pair of conspicuous whitish papillae below the vent; numerous similar but smaller papillae on adjoining portions of the femora, those on the posterior surface conspicuous against

¹Fenneman, Map of the Physical Divisions of the United States. U. S. Geological Survey, 1930.

dusky interspaces, but those on the ventral surface inconspicuous on a pale ground color; lower lip dusky, variegated with light markings; a dusky stripe from angle of mouth to front of arm insertion; throat dusky, lighter posteriorly; chest, abdomen, ventral surface of femur and tibia, and inner surface of tarsus creamy or straw-colored, practically immaculate; webs variegated with dusky.

Measurements.—The measurements of the type and of two adult male topotypes—all collected on the same day—are: length (snout to vent), 26, 26, 25 mm.; intergenual extent, 28.5, 27, 26; tibia, 16, 15, 15; whole hind foot, 21.5, 19, 19; weight (preserved), 2.2, 1.9, 1.6 grams.

The average measurements of five adult males and of ten adult females from Tulsa County, Oklahoma, are, respectively: length, 24.1, 29.2; intergenual extent, 25.4, 30.3; tibia, 14.4, 17; whole hind foot, 18.7, 22.3; weight (preserved), 1.3, 2.2 grams. The average weight of *blanchardi* is practically double that of *crepitans*.

Distribution.—Chiefly the Interior Plains and Interior Highlands of the United States; north to the southern parts of Wisconsin, Minnesota, and South Dakota; east to southwestern Michigan, northwestern Indiana, Illinois, southeastern Missouri, and northeastern Arkansas; south to southwestern Texas; and west to central Nebraska, eastern Colorado, and southeastern Arizona.

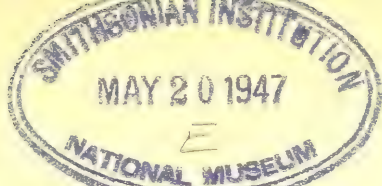
Remarks.—The extensive list of specimens examined is reserved for later publication.

In general, the dorsal color pattern seems to be less distinct in *blanchardi* than in *crepitans*. In the former, the somewhat extensive dusky area on the posterior surface of the femora in the vicinity of the vent, filling up the interspaces between the whitish papillae, is generally contiguous with the dark brown or dusky lengthwise stripe just above this area. In *crepitans*, on the other hand, this stripe is generally bordered by a light area on both sides throughout its length except just above the vent. Herein lies one of the principal differences in color pattern between *blanchardi* and *crepitans*.

Presumably intergradation between these two subspecies takes place along their entire line of contact from Michigan to the Rio Grande. Intermediate specimens have been noted from various localities in Missouri and Texas along the inner edge of the Coastal Plain.

The place filled by Frank Nelson Blanchard (1888-1937) in the recent annals of American herpetology was fairly unique. His complete sincerity, his altogether unselfish devotion to his favorite science, to his students, and to his colleagues, together with his high standards of scholarship, set him far apart from the average of humanity. It is a privilege to pay a slight tribute to the memory of such a friend in the naming of this little amphibian, with which he had become acquainted beside the prairie waters of Iowa.

The type specimen has been generously donated by Charles E. Mohr to the Carnegie Museum.
Moylan, Pa.



PROCEEDINGS

OF

BIOLOGICAL SOCIETY OF WASHINGTON

THREE NEW ASTERACEAE FROM GUATEMALA

By S. F. BLAKE

The three new Asteraceae here described are based upon specimens collected by Dr. Julian A. Steyermark in Guatemala and sent me for examination by Mr. Paul C. Standley of the Chicago Museum of Natural History (formerly Field Museum).

Alomia cordata Blake, sp. nov.

“Frutex;” caulis dense et sordide patenti-pilosulus apice trichotomus; folia opposita, petiolo nudo dense patenti-pilosulo 2.3-3.5 cm. longo, lamina ovata acuminata basi cordata infra apicem integram crenato-serrata ca. 8 cm. longa 6 cm. lata supra puberula subtus dense cinereo-pilosula 3-nervia et modice reticulata; capitula ca. 25-27-flora ca. 7 mm. alta brevissime pedicellata in glomerulos saepe ternatos aggregata; involucri anguste campanulati 5-6 mm. alti pphllaria linearia acuminata substraminea aetate rigida 3-vittata dorso pilosula ca. 0.6-0.9 mm. lata; receptaculum paleaceum, paleis anguste linearibus rigidis acuminatis; achenia glabra epapposa.

“Shrub 5-8 ft. tall;” stem uniformly leafy to the inflorescence, about 2.5 mm. thick above, internodes 5-6.5 cm. long; longer hairs of stem and petioles several-celled, acuminate, sordid or in youth purplish, 1 mm. long or less, mixed with much shorter inconspicuous gland-tipped hairs; leaves with inconspicuous pale sessile glands beneath between the hairs, the blades of the upper ones 7.5-9 cm. long, 5-7 cm. wide; peduncles 0.8-2.5 cm. long, the pedicels 1.5 mm. long or less; bracts subtending the glomerules ovate, their blades 1 cm. long or less; heads (moistened) campanulate, ca. 7 mm. high, 4.5 mm. thick; phyllaries rather shortly acuminate, rather densely pilosulous, not glandular, the principal ones subequal, a few shorter and narrower outer ones present; pales of receptacle slightly sessile-glandular on back, otherwise glabrous, about 5.3 mm. long, 0.3-0.4 mm. wide; corollas (color ?) sparsely stipitate-glandular, 3.5 mm. long (tube ca. 1.3 mm., throat slightly amplate above, 1.8 mm., teeth 0.4 mm. long); achenes slender, blackish, glabrous, 5-ribbed, 1.6-1.8 mm. long, crowned with a thickish whitish collar which is definitely the detergent base of the corolla and not a pappus.

GUATEMALA: Dry southwest-facing rocky slopes and bluffs of metamorphosed dolomitic rock, Loma El Picacho, above Santa Rosalia, Sierra de Las Minas, Dept. Zacapa, alt. 1200-1600 m., 15 Jan. 1942, J. A. Steyermark 42712 (type no. 1, 142, 283, Herb. Field Mus.; photog. and fragm., Nat. Arb. Herb.).

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This species, represented by a specimen with over-mature heads, comes in the first group of the subgenus *Eualomia* in Robinson's revision (1913), and is at once distinguished in that group by its broadly ovate-cordate leaves, which are densely pubescent beneath. In appearance it is rather similar to *Ageratum rugosum* Coult., a species of Guatemala and extreme southern Mexico (Chiapas), but in that the heads, although clustered, are not glomerate in the manner of *Alomia cordata*, the receptacle is naked, and the achenes bear a pappus.

The stem of the herbarium specimen shows no trace of woodiness, and the plant may very well be merely suffrutescent rather than a true shrub.

Oyedaea steyermarkii Blake, sp. nov.

Frutex ramosus usque ad apicem foliosus; caulis (vel ramus) dense strigillosus; folia opposita oblongo-elliptica ad ovalia 10.5-12.5 cm. longa 3.3-6 cm. lata acuminata basi cuneata crenato-serrulata breviter petiolata penninervia vel nervis inferioribus validioribus ca. 7-plinervia rigide pergamentacea supra aequabiliter sed non dense strigillosa pilis aetate basi leprosis infra similiter sed densius strigillosa pilis paullo laxioribus, venis et venulis subtus prominulis; capitula radiata pauca mediocria per 3-6 apice ramorum et in axillis superioribus cymoso-paniculata, foliis multo breviora; involucri ca. 3-seriati vix gradati 6 mm. alti omnino appressi phyllaria extima ca. 5 oblonga v. oblongo-ovata acutiuscula inconspicue calloso-apiculata dense strigillosa indurata vel basi lateraliter subscarioso-marginata, interiora oblonga v. oblongo-ovalia tenuiora straminea margine subcariosa ad apicem minute hispidulo-ciliolata medio dorsi strigillosa; radii neutrales vix bene visi; paleae acuminatae carinatae; achenia radii trigona angustissime vel vix 3-alata, pappi paleis late lanceolatis 2-3 basi connatis, squamellis non distinctis; achenia disci compressa paene glabra angustissime vel vix 2-alata, pappi paleis 2 lanceolatis cum squamellis ca. 12 multo brevioribus basi valde connatis conjunctis.

"Shrub 8-10 ft. tall;" stem (or branch) subterete, striatulate, light brownish; petioles naked, somewhat broadened at base, densely strigillose, 3-5 mm. long; leaf blades dark green, above somewhat shining and in age conspicuously maculate with the flattened white bases of the hairs, crenate-serrulate nearly throughout (teeth small, obtusish, callous-tipped, about 0.5 mm. high, mostly 5-8 mm. apart), the veins in age impressed above, with the veinlets prominulous-reticulate beneath; peduncles about 4-10 mm. long, the pedicels 5-18 mm. long; outer phyllaries about 6 mm. long, 2 mm. wide, the inner about as long or slightly longer, 2.5-3 mm. wide; disk (in ripe fruit) hemispheric, 1 cm. high, 1-1.3 cm. thick; rays (immature) neutral, 3-toothed, the lamina ca. 5 mm. long; disk corollas (poorly preserved) ca. 4.2 mm. long, the teeth hispidulous; pales abruptly acuminate, minutely hispidulous on keel and margin above, about 8 mm. long; ray achenes normally formed but with abortive embryo, sharply trigonous, 1-nerved on each face, minutely hispidulous on the angles, otherwise essentially glabrous, about 3.8 mm. long, the 3 triangular awns acuminate, trigonous, sulcate inside, minutely hispidulous on margin, connate at base except on outer side of achene, 2.7-3.2 mm. long, persistent; disk achenes obovate-oblong, 3.8-4 mm. long, 1.5-1.8 mm. wide, shining brown, sparsely and minutely strigillose, com-

pressed, slightly thickened, acute-edged, 3-nerved on the sides (the middle nerve stronger and somewhat prominent), somewhat impressed at apex at the base of the pappus, the 2 awns of pappus unequal, 2.5-3.2 mm. long, triangular, acuminate, trigonous, sulcate within, minutely hispidulous on margin, decurrent on the narrowed apex of achene as narrow wings continuous with the still narrower or obsolete wings of the achene, firmly connate at base with the squamellae, the latter linear-oblong, obtuse or acutish, minutely hispidulous-ciliolate on their free apices, about 0.6-1 mm. long, the whole persistent.

GUATEMALA: On top of knife-edge limestone ridge, Cerro Chinajá, between Finca Yalpemech and Chinajá, above source of Río San Diego, Dept. Alta Verapaz, alt. 150-700 m., 1-2 April 1942, *J. A. Steyermark* 45686 (type No. 1,148,166, Herb. Field Mus.; photog. and dupl., Nat. Arb. Herb.).

This species is ascribed to *Oyedaea* with some hesitation. The 3 sheets examined are in very mature fruit, and I was able to find only a single, not fully developed ray corolla and a few over-mature disk corollas. The lack of a differentiated herbaceous tip to the phyllaries would place the species, if really an *Oyedaea*, next to the Mexican *O. ovalifolia* A. Gray, which has triplinerved leaves and a very loose and open paniculate inflorescence, as well as many differences in details.

The receptacular pales show a strong tendency to leave the receptacle in an entangled mass, bearing the achenes among them, and each splitting up the back, but I cannot help suspecting that this is due to some pathological condition of the head. In any case, further material in less mature condition is to be desired.

***Verbesina eperetma* Blake, sp. nov.**

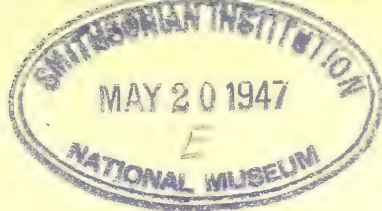
Herba virgata foliosa 3-metralis, inflorescentia parce pubescente excepta glaberrima, infra inflorescentiam simplex; caulis non alatus, internodiis superioribus 1-2 cm. longis; folia alterna lineari-lanceolata ca. 15 cm. longa 1.7 cm. lata longe acuminata basi rotundata brevissime petiolata subintegra penninervia, capitula majuscula pedunculata subcorymbosa ca. 13 pro caule in ramis 1-5-cephalis; involucri ca. 4-seriati gradati 1-1.2 cm. alti phyllaria plerumque oblongo-ovata appendice herbacea lineari-lanceolata patente vel reflexa 7-10 mm. longa praedita; achenia angustissime alata, aristis 1-2 fragilibus.

"Herb 8-10 ft. tall;" upper part of stem subterete, 4 mm. thick, purplish becoming yellow-brown, glabrous, pithy, wingless but marked by decurrent lines from the leaf-bases; leaves erectish; petioles broad, naked, glabrous, 2 mm. long; blades 13.5-15.5 cm. long, 1.6-1.8 mm. wide, acuminate and more or less falcate, obscurely callous-serrulate (the very blunt teeth mostly concealed by the narrowly revolute margin, only about 0.3 mm. high and 1.5-3 mm. apart), dark green above, lighter green beneath, glabrous on both sides or obscurely and microscopically pubescent beneath, not lepidote, featherveined (principal lateral veins 40 pairs or more, prominulous, the veinlets reticulate but not raised, translucent, the costa whitish and prominent beneath); heads 1 at tip of stem (on a short few-bracted peduncle 2 cm. long) and by 1's to 5's on erect branches 4.5-13.5 cm. long arising from the uppermost leaves, the branches purplish, thinly and unevenly appressed-pubescent, bearing leaves 3.5-6 cm. long, the peduncles somewhat thickened above, striate,

thinly appressed-pubescent, the terminal one 3-22 mm. long, the lateral 1.5-4 cm., bearing 1 or few linear bracts 12 mm. long or less; involucre (excluding the loose leafy tips) ca. 1-1.2 cm. high, broadly campanulate, the outermost phyllaries narrowly lance-linear, with very short body (1.1-1.8 mm. wide) and wide-spreading herbaceous tip, the others with ovate or oblong-ovate body 3-4 mm. wide, olive-brown, pale-margined, more or less short-ciliate, dorsally essentially glabrous, firm and somewhat thickened, with herbaceous appendage (in all except the acuminate inmost), this glabrous, 1.5-2 mm. wide, acute; disk (flowers fallen) 1-1.5 cm. high, 1.5-2 cm. thick (as pressed); disk corollas (over-mature) ca. 7.5 long (tube 2 mm., glandular-puberulous, throat 4 mm., teeth 1.5 mm. long); pales acute or acuminate, straightish or slightly recurving at apex, firm, olivaceous above, finely stipitate-glandular along the very narrow keel, about 12 mm. long; achenes oblong-obovate, 4.8-7 mm. long, ca. 2.2 mm. wide, with blackish finely hispidulous body and 2 very narrow subequal hispidulous-ciliate whitish wings (ca. 0.3 mm. wide); awns 2, or usually 1 in the outer flowers, somewhat unequal, finely hispidulous, 4-5.5 mm. long.

GUATEMALA: Sierra de Las Minas, trail between Santa Rosalía de Mármol and Vegas, Dept. Zacapa, 19 Jan. 1942, *J. A. Steyermark* 42933 (type No. 1,148,693, Herb. Field Mus.; photog. and fragm., Nat. Arb. Herb.).

The heads of the type are unfortunately so mature that I have not been able to establish the presence or absence of rays. Although the ray achenes in some species of the genus are readily distinguishable from those of the disk, being triangular with a single awn on the inner angle, this is not the case in all, so the absence of differentiated outer achenes in this species is no indication that the heads are discoid (the outer achenes with only a single awn, mentioned in the description above, bear a tubular disk flower when any corolla is present). The relationship of *V. eperetma* is pretty certainly with such species as *V. virgata* Cav., of the section Saubinetia, and it may be inserted for the present next to that species, although the absence of cauline wings would place it farther along in Robinson and Greenman's synopsis (1899). The comparatively large heads, in combination with the narrow glabrous leaves, are distinctive. The specific name, from the Greek ἐπὶ ῥετμος, *provided with oars*, refers to the spreading herbaceous appendages of the phyllaries.



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PROCEEDINGS
OF
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DESCRIPTION OF A SUBSPECIES OF *MYOTIS*
YUMANENSIS FROM BAJA CALIFORNIA, MEXICO

BY SETH B. BENSON

*Museum of Vertebrate Zoology, University of California,
Berkeley, California*

In the course of a study of geographic variation in some bats of western North America I found that a small series of *Myotis yumanensis* (H. Allen) from central Baja California represents an heretofore undescribed subspecies. This subspecies may be known as:

Myotis yumanensis lambi, subsp. nov.

Type.—Male, old adult, skin and skull, No. 38194 Mus. Vert. Zool.; from San Ignacio, lat. $27^{\circ} 17'$, Baja California, Mexico; collected May 19, 1927, by Chester C. Lamb, original number 7685.

Distribution.—Known only from the type locality, but probably present in suitable habitats in Baja California south of the Sierra San Pedro Mártir.

Diagnostic characters and comparisons.—A subspecies of *Myotis yumanensis*, as defined by Miller and Allen (1928, U. S. Nat. Mus. Bull. 144), characterized by small size and light yellowish-brown dorsal color. Compared with near topotypes of *M. y. yumanensis*, *M. y. lambi* is smaller in size, darker in color of ear and wing membranes, more richly colored on the back, and has a suffusion of yellowish color on the tips of the hairs of the ventral surface. Compared with the type series of *M. y. sociabilis* H. W. Grinnell, *M. y. lambi* is smaller in size and paler in color. Compared with the type and paratype of *Vespertilio obscurus* H. Allen (synonymized with *M. y. yumanensis* by Miller and Allen, *op. cit.*) *M. y. lambi* differs as it does from *M. y. sociabilis*.

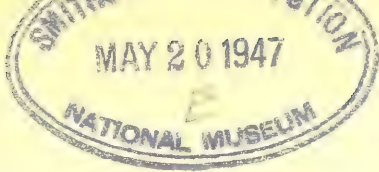
Average and extreme measurements are: forearm (7 specimens), 30.2 (29.6-31.9); condylobasal length of skull (7 specimens), 12.0 (11.4-12.5).

Specimens examined.—Total number 7 (5 skins with skulls, 2 alcoholics), all adult specimens from San Ignacio.

Remarks.—Only a small number of *Myotis yumanensis* have been recorded from Baja California. Miller and Allen referred to *M. y. yumanensis* one specimen from Rio Pescadero (in the delta region of the Colorado River), and 18 specimens from Rancho San Antonio (west base of the Sierra San Pedro Mártir). They also referred to this subspecies the type and paratype of *Vespertilio obscurus*, originally described from "Lower California." Miller and Allen, with a query, gave the locality

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as "Cape St. Lucas." The subspecies in the delta region is unquestionably *M. y. yumanensis* as shown by two specimens available to me. The specimens from San Antonio, which I have seen, are variable in color, some specimens are pale as in *yumanensis* and others as dark or darker than typical *M. y. sociabilis*. For the present they may be referred to *M. y. yumanensis*. The status of *Vespertilio obscurus* is uncertain, and will be discussed in a future report. It is sufficient at this time to state that the two specimens upon which the name is based are subspecifically distinct from *M. y. lambi*. It will be necessary to collect specimens of this species from the Cape San Lucas region before it will be possible to be certain that the specimens of "*V. obscurus*" came from there. It seems improbable to me that this area would be inhabited by larger individuals than occur at San Ignacio since the outstanding feature of the bats of Baja California is the strong tendency, in many species, for the development of dwarfism toward the south. Because the two examples of *obscurus* are much like some of the specimens from Rancho San Antonio they may at present, like them, be referred to *M. y. yumanensis*.



PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTON

THE TEXAN SUBSPECIES OF THE TREEFROG,
HYLA VERSICOLOR

BY HOBART M. SMITH and BRYCE C. BROWN

Two Texan subspecies of *Hyla versicolor* have generally been recognized for a good many years. Not all authors have agreed, however, upon their definition and range. Our experience bears out the perhaps most common view which admits of a western subspecies (here called the Texan treefrog) restricted to the Balcones escarpment and its environs and an eastern subspecies (here called the Mississippi treefrog) widely distributed east of the escarpment area.

The Texan subspecies may be diagnosed as follows: rear of thigh light (orange in life), with fine white flecks, entirely lacking dark marks except at extreme medial border; fingers not or only barely perceptibly webbed; skin smooth; maximum snout-vent length lesser, 43 mm. in males, 48 mm. in females (*vide* Wright and Wright, Handbook of Frogs and Toads, 1942); song different, a longer, lower trill. We have taken these treefrogs at numerous localities in Atacosa, Bastrop, Hays and Travis Counties.

The Mississippi subspecies, on the other hand, possesses the following characters: rear of thigh extensively dark marked, the dark forming a network which surrounds more or less orange (light in preservative) spots of medium size (size of digit pad); fingers markedly webbed, especially the outer and middle pairs; skin more rugose; maximum snout-vent length greater, 60 mm. in females and 51 mm. in males according to Wright and Wright; song different, a shorter, louder, more nasal trill. The roughness of the skin is variable. We have examined specimens of this subspecies from numerous localities including a number from Austin, Brazos, Dallas, Houston, Jasper and Leon Counties. Many other records in the literature indicate that the race blankets the entire eastern quarter of the state.

The scientific names for these well established races have not, apparently, been properly chosen. The eastern subspecies has, generally, been taken as *Hyla v. versicolor*, the western as *H. v. chrysoscelis*. Actually the type locality of the latter is Dallas, Texas, where only the eastern race is to be expected. Furthermore, Cope describes a number of features—black marks encircling medium-sized orange light spots on rear of thigh, large size, and webs on fingers, all of which point definitely to the eastern race. The name *chrysoscelis*, can therefore not be applied to the Texan subspecies, which we name:

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***Hyla versicolor sandersi*¹ subsp. nov.**

Holotype.—U. S. Nat. Mus. Coll. No. 123978, taken 8 miles southwest of Somerset, Atascosa County, Texas, on April 27, 1946, by Mr. A. J. Kirn.

Paratypes.—B.C.B.² Nos. 381-388 collected May 2, 1942, 12 miles northwest of San Marcos, Hays County, Texas, by Bryce C. Brown; B.C.B. Nos. 1857-60 collected March 31, 1946, 3 miles west of McDade, Bastrop County, Texas, by Bryce C. Brown; B.C.B. Nos. 1896-99 collected April 3, 1942 in northwest Austin, Travis County, Texas, by B. C. Brown; B.C.B. No. 1960 collected on May 2, 1942 ten miles northwest of San Marcos, Hays County, Texas, by B. C. Brown; B.C.B. Nos. 3534-44 collected September 2, 1946, 8 miles southwest of Somerset, Atascosa County, Texas, by A. J. Kirn; T.C.W.³ No. 1911-22 collected April 28, 1946, 8 miles southwest of Somerset, Atascosa County, Texas, by A. J. Kirn.

Diagnosis.—As stated above, 2nd paragraph.

Description of type.—Head short, broader than long; snout bluntly pointed in dorsal profile; canthus rostralis rounded; tympanum slightly larger than dilated pad of finger, directly behind eye; vomerine teeth on tubercles, projecting just behind a line connecting the internal nares; tongue nearly orbicular in outline, slightly notched behind. Body moderate, waist narrow. Limbs moderate, heel of hind limb reaching forward to eye. Disks on fingers and toes well developed, broad; fingers without webs but toes moderately webbed. Terminal phalanx of toes 2, 3, 4, and 5 free, and terminal and penultimate phalanges on first toe free.

Dorsal integument finely granular, ventral surface of thigh and belly coarsely granular, skin elsewhere similar to dorsal integument.

Color above brownish gray with a very dark brown pattern; a large irregular dark brown cross and smaller irregular dark markings on back; dark bordered light spot below each eye; each upper eyelid with a dark bar; a dark bar from eye through nostril to tip of snout; area from eye through tympanum to insertion of arm with a dark mottled band; limbs dark cross barred; groin and concealed portions of legs bright orange; rear of femur with scattered white spots on orange, white spots becoming outlined with black only at extreme medial border; color below white, the throat suffused with dark.

Measurements of the type specimen are: total length 40.1 mm., anus to knee 20.4 mm., knee to heel 19.2 mm., heel to tip of 4th toe 27.8 mm., intertympanic width 12.8 mm., interorbital space 7.7 mm., greatest width of head 13.7 mm., length of head from posterior edge of tympanum to tip of snout 12.9 mm.

Range.—The Balcones escarpment and its vicinity in central Texas, south at least to Atascosa County, east to Bastrop County, north to Travis County and no doubt to McLennan County. Occurrence outside of the state is highly improbable.

¹Named for Mr. and Mrs. Ottys Sanders of Dallas, Texas, who kindly provided topotypes of *H. v. chrysoscelis* and who have long been ardent students of Texan amphibiology.

²B.C.B.—Bryce C. Brown Collection, College Station, Texas.

³T.C.W.—Texas Cooperative Wildlife Collection, College Station, Texas.

Remarks.—Occasional specimens from Brazos County and Leon County have the rear surface of the thighs light-colored and with very little dark marking. These variants may well be interpreted as indicating a somewhat intermediate population, although there is no question that they far more closely approach the typical eastern than the western race.

The name for the Mississippi race is not so easily established. We regard, however, that the lower Mississippi Valley and adjacent western lowlands are inhabited by specimens fairly uniformly different from northern specimens in the character of the pattern on the rear surface of the thigh. The dark color forms a network enclosing circular light areas in the Mississippi race, but tends to be more open in northern specimens. It seems reasonable therefore to allocate the name *H. versicolor chrysoscelis* to the Mississippi subspecies. It is

Hyla versicolor chrysoscelis Cope

Hyla femoralis chrysoscelis Cope, Bull. U. S. Nat. Mus. No. 17, 1880, p. 29.

Type locality.—Dallas, Texas.

Type.—U. S. Nat. Mus., now lost.

Diagnosis.—Like *H. v. versicolor* except rear surface of thigh more extensively dark marked, leaving only isolated, circular light areas of moderate size; differs from *H. v. sandersi* as stated in paragraph 3 of this paper.

Range.—Lower Mississippi Valley west through eastern Texas to about Leon and Austin counties.

University of Illinois, Urbana, Illinois.

College Station, Texas.



OF
BIOLOGICAL SOCIETY OF WASHINGTON

COMMENT ON CERTAIN BIRDS OF BAJA
CALIFORNIA, INCLUDING DESCRIPTIONS
OF THREE NEW RACES

BY A. J. VAN ROSSEM

This paper is one of a series, some already published, some in press, or in manuscript, dealing with taxonomic problems which have been encountered during preparation of a distributional work on the birds of Baja California. It is published at this time because that territory is within the scope of the American Ornithologists' Union Check-list and the cases here presented must be acted upon by the Committee now engaged in the preparation of a new edition. As in previous papers the content is limited to new proposals or to endorsement or rejection of others which require Committee action.

As in the past I have had unrestricted access to various collections, both institutional and private, acknowledgment of which will be made later. However, I must mention here the aid provided by the courtesies of the Museum of Vertebrate Zoölogy and the San Diego Natural History Museum, since the greater part of the data in the present instance have been acquired at those institutions.

Rallus longirostris magdalenae subsp. nov.

Magdalena Clapper Rail

Type.—Breeding male adult, No. 59279, Museum of Vertebrate Zoölogy; Almejas Bay, Santa Margarita Island, Magdalena Bay, Baja California, June 7, 1931; collected by Chester C. Lamb.

Subspecific characters.—Darkest and most richly colored of the Pacific coast clapper rails. Most nearly similar in color to *Rallus longirostris beldingi* of the Gulf coast and islands of extreme southern Baja California but black mesial streaking of upper parts wider and margins of feathers "Olive-Brown" instead of "Buffy Brown" or "Deep Olive"; shoulders "Natal Brown" instead of "Verona Brown"; anterior underparts "Kaiser Brown" or "Russet" instead of "Mikado Brown"; sides and flanks "Dark Olive" instead of "Deep Olive," with the white barring consequently more conspicuous. Bill slightly longer; wing slightly shorter.

Range.—Tidal lagoons of the Pacific coast of Baja California from Magdalena Bay north to Scammon Lagoon and probably to San Quintín Bay. Casual in fall dispersal south to Todos Santos, lat. 23° 27'.

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Remarks.—Although inclined strongly to believe that the arrangement of Peters (Check-list of Birds of the World, 2:159, 1934), whereby the western rails are treated as races of *Rallus elegans*, is preferable to the species name *longirostris*, I here use the latter in the interest of conformity to current usage.

In most typical form and greatest differentiation from *beldingi*, the new race here proposed is restricted to the extensive mangrove lagoons and estuaries of Magdalena Bay. An extensive series of twenty-five specimens (San Diego Mus.) from Pond and San Ignacio lagoons is essentially similar in darker underparts, broad dorsal streaking, and longer bill, but the dorsal coloration is more varied and some individuals approach the more olive tones of *Rallus longirostris levipes* of southern California. A similar comment applies to a small series of four specimens from Scammon Lagoon. Whether this condition signifies intergradation or whether two color phases are involved I am not prepared to say. However, certain measurements suggest the former possibility. Three specimens, all collected in midwinter, have been examined from San Quintín Bay. Two of these (then in the collection of W. M. Pierce) I at one time identified as *beldingi*. One of them has been re-examined at this time in the Sheffler collection and is identified as *magdalenae*. The third specimen, in the Museum of Vertebrate Zoölogy, is to be identified only as *levipes*. My belief at this time is that *magdalenae* is the resident form at San Quintín, with *levipes* present as a winter casual.

Measurements.—

		Wing		Culmen		Depth of bill at nostril
6 male <i>magdalenae</i>	144.5	(148.5)	153.5	60.0	(61.5)	63.7
12 male <i>beldingi</i>	150.0	(154.0)	161.0	55.5	(58.2)	61.0
5 female <i>magdalenae</i>	141.0	(143.1)	146.0	51.0	(54.8)	57.0
5 female <i>beldingi</i>	143.0	(146.0)	149.5	50.7	(52.9)	54.6

Specimens examined. — *R. l. magdalenae*, 41 (Todos Santos, lat. 23°27' 1 [not breeding]; Almejas Bay, Santa Margarita Island, 3; San Jorge, 7; Pond and San Ignacio Lagoons, 25; Scammon Lagoon, 4; San Quintín Bay, 1). *R. l. beldingi*, 17 (La Paz and vicinity, 14; San José Island, 3). *R. l. levipes*, series from southern California; 1 from San Quintín, Baja California.

Zenaida asiatica clara subsp. nov.

San Lucas White-winged Dove

Type.—Male adult, No. 54990, Museum of Vertebrate Zoölogy; Agua Caliente, alt. 800 feet, June 8, 1929; collected by Chester C. Lamb.

Subspecific characters.—A relatively large race of *Zenaida asiatica* and in this respect not distinguishable from *Zenaida asiatica mearnsi* of the southwestern United States and northwestern Mexico. Differs from *mearnsi* in lighter coloration throughout; anterior underparts "Avellaneous" with a distinct ochraceous or yellowish tint instead of "Light Drab"; posterior underparts "Gull Gray" instead of "Pale Neutral Gray" or "Light Neutral Gray."

Range.—Resident in the Cape region of Baja California.

Remarks.—The abrupt character of the Cape avifauna is again emphasized in the case of the white-winged dove. Numerous specimens of *mearnsi* have been examined from practically the whole of the peninsula

south almost to the Cape region and in none of them can I detect any significant departure from the California, Arizona, and Sonora populations. It is to be expected that *mearnsi* will be found at times in the Cape region as a result of post-breeding dispersal or other seasonal movement but I do not anticipate any great number since over most of the peninsula it seems to be essentially resident. At the moment there is one example of *mearnsi* at hand from La Paz, a fully grown bird of the year collected July 17, 1931. Incidentally, the racial characters of *mearnsi* and *clara* are just as evident in feathered nestlings as they are in mature birds.

Specimens examined.—*Z. a. mearnsi*: series from southeastern California, Arizona, and Sonora: Baja California, (San Fernando, 3 [Nov. 1; Jan. 2-3]); San José, lat. 31, [Oct. 1]; El Cajón Cañon, 3 [May 16-June 3]; Las Palmas Cañon, 1 [Nov. 4]; San Agustín, 1 [Dec. 1]; 25 miles N. of Punta Prieta, 1 [Oct. 27]; 4 miles E. of El Arco, 1 [Apr. 22]; 10 miles W. of Calmallí, 1 [Feb. 23]; San Ignacio, 7 [Feb. 27; Apr. 11-May 3]; San Andrés, 1 [Oct. 21]; Mesquital, 1 [Apr. 20]; Comondú, 2 [Apr. 11]; La Paz, 1 [July 17]. *Z. a. clara*, 13 (El Sauz, 3 [Dec. 8-10]; Agua Caliente, 7 [June 5-13]; 7 miles S. of Miraflores, 1 [Nov. 1]; 3 miles S. of La Paz, 1 [Feb. 7]; Santa Anita, 1 [Apr. 25].

Colaptes cafer martirensis Grinnell

[= *Colaptes cafer collaris* Vigers]

For some years I have entertained the suspicion that this currently recognized race could not be maintained as distinct from *Colaptes cafer collaris*. It was based on four males and three females (in the Museum of Vertebrate Zoölogy), only two of which are summer birds and the remainder taken in the month of October. The two summer individuals, taken in May and June and presumably belonging to the breeding population of the area, I am unable to distinguish on any basis from the red-shafted flickers resident in southern California. The remaining five were collected in fall between the dates of October 8 and 22. The pileum of these is of average brownish *collaris* tone in two, brownish gray in one, and distinctly gray in two, one of them the type of *martirensis*. These last two are, to me, indistinguishable from the red-shafted flickers of the central interior of the continent in which the pileum approaches the gray of *Colaptes auratus*. Flickers of this appearance are common in fall and winter throughout the southwest. As further indication of the source of origin of part of the series upon which *martirensis* was based, one shows pronounced indications of a red nuchal band. Another individual collected subsequent to the appearance of the description has yellow-orange wing and tail webs. The supposed shorter tail of *martirensis* is due to the fact that in three of the seven birds the tails are defective.

Altogether, there are now in the Museum of Vertebrate Zoölogy eighteen flickers from northern Baja California which have been determined to be "*martirensis*." The browner individuals (which include the summer-taken birds) are not distinguishable from *Colaptes cafer collaris* of southern California and doubtless are representative of the resident population. The grayer birds are not distinguishable from flickers of the central interior. Therefore, until other evidence is produced, it would

seem best to drop *martirensis* as a recognizable race. It may be well to call attention to the fact that the name has several years priority over *Colaptes cafer canescens* Brodkorb (Occ. Papers Mus. Zool. Univ. Michigan, 314, 1935) if formal recognition of the red-shafted flickers of the interior population should ever be deemed advisable.

Dendrocopos villosus scrippsae (Huey)

[= *Dendrocopos villosus hyloscopus* (Cabanis and Heine)]

Recently, W. E. Clyde Todd has proposed (Ann. Carnegie Mus., 30: 312, 1946) that *scrippsae* be dropped as a synonym of *Dendrocopos villosus hyloscopus* on the ground that the slightly smaller size of the former was insufficient to provide sound basis for a separate name. No color or other distinguishing characters were claimed. The series in the Museum of Vertebrate Zoölogy fully bears out Todd's proposal. Sixteen males from the Sierra San Pedro Mártir and Sierra Juárez give average wing and tail lengths of 119.4 and 73.9 millimeters, respectively. Twenty males from central-western and southwestern California in the Dickey and Los Angeles Museum collections give corresponding averages of 124.2 and 76.0 millimeters, and even these small differences tend to be obscured by individual variation. Most birds of the series upon which *scrippsae* was based have very short tails just as Huey has stated; unfortunately they have proved to be misleading. Oberholser, in his revision of the hairy woodpeckers many years ago (Proc. U. S. Nat. Mus., 40: 611, 1911), made a sound disposition of the case when he stated that Baja California birds expressed the best development of the race *hyloscopus*.

Thryomanes bewickii magdalenensis Huey

Magdalena Bewick Wren

This race, proposed (Trans. San Diego Soc. Nat. Hist., 9: 430, Oct. 1, 1942) from the southernmost area known to be inhabited by Bewick Wrens in Baja California, fully merits recognition. It is by far the grayest of the Pacific coast mainland forms of this species. In paleness as well as grayness it recalls in some measure *eremophilus* of the southwestern deserts and *leucophrys* of San Clemente Island. It is thus in abrupt contrast to the exceptionally dark-colored *cerroensis* of the middle portions of the peninsula. In addition to the original series from Santo Domingo (lat. 25°30') and Arroyo Seco in the San Diego Natural History Museum, I have seen seven specimens from Santo Domingo, El Médano, Metancita, and San Jorge in the Museum of Vertebrate Zoölogy. These latter are, in part, juveniles, and it is to be noted that the racial characters are fully as definite as they are in adults.

A mid-peninsular race, *Thryomanes bewickii atricauda*, proposed in the same paper does not appear to me to be separable from *cerroensis*.

Aimophila ruficeps lambi Grinnell

[= *Aimophila ruficeps canescens* Todd]

On the basis of the material in the Museum of Vertebrate Zoölogy in 1926, the definition of this currently accepted race was justified. Specimens collected since that time show it to be a synonym of *Aimophila ruficeps canescens*. In *canescens* there are two extremes of coloration, a

buffy and a grayish manifestation or phase and these occur throughout the range, seemingly regardless of age, sex, or season. This is at variance with the usual behavior of this species which tends normally to a notable degree of uniformity within a given geographic area. The six specimens upon which *lambi* was described are predominantly of the gray extreme, so much so that there was the temptation to accord the supposed race a rather skeptical recognition in spite of some negative evidence in the M. V. Z. collections. However, the collections at the San Diego Natural History Museum show such definite further evidence that there appears not the slightest reason to regard the rufous-crowned sparrows of the northern Baja California mainland as other than *canescens*. No size differences were claimed but it is worth noting that fair samples from southern California and northern Baja California provide almost identical averages.

***Aimophila ruficeps sanctorum* subsp. nov.**

Todos Santos Rufous-crowned Sparrow

Type.—Male, marked as "adult," No. 50124, Museum of Vertebrate Zoölogy; Todos Santos Islands, off Ensenada, Baja California, January 13, 1927; collected by Chester C. Lamb.

Subspecific characters.—Ventrally, the darkest and grayest (most plumbeous) of the races of *Aimophila ruficeps*. Dorsally, most nearly similar to the darker and grayer examples of *Aimophila ruficeps canescens* of southwestern California and northwestern Baja California but averaging still darker, the general color of the dorsum and crown close to "Mars Brown" rather than grayish "Kaiser Brown," and with the grayish edgings narrower, darker, and less in evidence. Size somewhat smaller than *canescens*, particularly in length of tail.

Range.—Todos Santos Islands, northern Baja California.

Remarks.—I am at a loss to account for the comment offered by Grinnell (Distribution Summation of the Ornithology of Lower California, p. 173), to the effect that Todos Santos Islands specimens are intermediate between *canescens* and "*lambi*." Actually, they exhibit in remarkably stable form the darkest and most plumbeous underparts of any of the North American races and, so far as I am aware, the darkest to be found in the species.

In this as in other instances of observed speciation trends operative in Baja California and the Gulf area, an insular population has developed one or more characters to be seen more or less intangibly in elements of the adjacent mainland population. In other words, isolation combined with the intensive inbreeding which necessarily must occur within an ecologically suitable, sequestered area of limited extent, has fixed and accentuated tendencies to a point where taxonomic recognition is in order. It may be remarked, further, that the Todos Santos Islands are only about three miles off shore, and climatically differ slightly or not at all from the adjacent mainland.

Specimens examined.—*A. r. canescens*: California, 27 (Ventura County, 1; Los Angeles County, 4; Riverside County, 5; San Diego County, 17). *A. r. "lambi"*: Baja California, 24 (5 miles S. of Mon. 258; S. end Valle de las Palmas; Las Cruces, 20 miles E. of Ensenada; San José, lat. 31°; San Telmo; El Valle de la Trinidad; Valladares; El Cajón Cañon; Boca de la Playa, 16 miles W. of Santo Tomás; N. end

Nachogüero Valley; Mouth of San Telmo River; Colnett; Concepción).
A. r. sanctorum: 24 (Todos Santos Islands).

Measurements.—The following measurements are for males.

	Wing	Tail	Culmen	Depth at Base	Tarsus	Middle Toe Minus Claw
18 <i>canescens</i>	59.7	66.7	10.3	6.4	19.1	14.1
15 “ <i>lambi</i> ”	59.9	67.3	10.3	6.3	19.4	14.0
10 <i>sanctorum</i>	60.4	64.7	10.0	6.2	18.3	13.6
[9 ♀ <i>sanctorum</i> ..	57.8	62.1	8.8	6.1	18.0	13.5]

Amphispiza belli xerophilus Huey

Coastal Bell Sparrow

Although known only from the type locality, Santa Catarina Landing at lat. 29°30' on the Pacific coast, and probably possessing a very limited distribution, this proposed race of the Bell Sparrow appears to be well worthy of recognition. The characters are substantially as given in the original description (Trans. San Diego Soc. Nat. Hist., 6: 229, Dec. 24, 1930), that is to say intermediate in general coloration between *belli* and *cinerea*, although closer to *belli*, but possessing more uniform upperparts and broader flank streaking than either. An additional circumstance to be taken into consideration is that *belli* over the whole of its range in Baja California south to San Quintín and San Martín Island where apparently it abruptly stops, exhibits remarkably stable characters with no suggestion of intermediacy toward *cinerea*. The same observation holds true in regard to the latter race and I can see no trend toward *belli* in the specimens from Santa Rosalía Bay in the Museum of Vertebrate Zoölogy. They are not in the best of plumage, however, and in view of the comment by Ridgway (Birds of No. and Mid. Amer., Pt. 1, p. 268, 1901), it is evident that further specimens from this critical locality would be desirable.



BIOLOGICAL SOCIETY OF WASHINGTON

THE VENEZUELAN RACES OF PIAYA CAYANA

BY W. E. CLYDE TODD

Cuculus cayanus Linnaeus, 1766, as its name implies, was described from Cayenne, French Guiana. Twenty specimens have been examined from that country, including six from Cayenne. This, the nominate race, ranges through the Guianas and west to the Orinoco Valley in Venezuela. Eight specimens examined from the latter region are on an average darker-colored (especially below) than topotypical French Guiana birds, but are rather too close for formal separation.

The north-coast bird, however, is clearly racially distinct, as I am satisfied after handling a series of thirty-three specimens from various places from the State of Lara to the Paria Peninsula. Since the publication of the extended report on the birds of the Santa Marta region (1922) I have altered my views considerably. In the first place, I think that birds from the Caribbean coast of Colombia and Venezuela are all one and the same form. I called them *columbiana* of Cabanis, 1862, which was described from Cartagena, and there is no question as to the pertinence of this name, which was accepted by both Ridgway and Chapman. However, Peters (1940) adopts *mehleri*, Bonaparte, 1850, as the earliest name for this race, the range of which he assigns to the Magdalena Valley as far up as Chicoral, and eastward along the coast to the Paria Peninsula. This range, be it noted, would take in Caracas, which he accepts as the type-locality of the race *circe* Bonaparte—in this following G. C. A. Junge (Zool. Meded. Leiden, 19, 1937, 183-185). Through the courtesy of Dr. Herbert Friedmann I have had the opportunity of consulting Dr. Junge's paper. The author insists that Bonaparte's type-specimen of *mehleri* is identical with the birds usually called *columbiana*. In such case this type could scarcely have come from the ascribed and restricted type-locality, Bogotá, where (according to Chapman) only *mesura* occurs. Mainly on this ground I propose to substitute Cartagena for Bogotá as type-locality. After seeing a series of the interior race *mesura* I am now prepared to admit that it is a connecting link between *cayana* and *mehleri*. A single specimen from Santa Elena, Venezuela (No. 90,757), agrees closely with Colombian specimens, and carries the range of *mesura* into the Maracaibo Basin of Venezuela.

Through the courtesy of the authorities of the Chicago Natural History Museum I have had the privilege of examining three specimens of the *Piaya cayana venezuelensis* of Cory from the Maracaibo region—the same specimens that were later sent to Dr. Junge and by him compared directly with Bonaparte's type of *circe*, with which they proved to be identical. To judge from these specimens, *circe* is a very distinct race,

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characterized by its dark coloration and small size. Dr. Junge says that the type is labeled as coming from Caracas, but if he has correctly identified these specimens as the same form nothing can be more certain than that it never actually came from there, since the Caracas bird is *mehleri*, as indeed has already been pointed out by Mr. W. H. Phelps (Bol. Soc. Venezolana Cienc. Nat., No. 56, 1943, 290). It is thus entirely probable that the type of *circe* came from Maracaibo instead.

I wish to put on record (for purpose of comparison) my measurement of these three specimens.

Field Mus. No.	Sex	Locality		
34590	♀	Orope, Zulia	Wing, 142; tail, 257	
34591	♂	Orope, Zulia	143	260 (worn)
44099	♀	Rio Catatumbo	144	270
34589	♀	Orope, Zulia	142	293 (fide Cory)

The Carnegie Museum also has four specimens of *Piaya cayana* from another part of the Maracaibo Basin—three from Sabana de Mendoza and one from La Azulita. One would expect that these would also be *circe* but they are definitely not. They resemble birds from the north-coast region in color, but they are markedly and uniformly smaller in size. I do not see how this can be merely accidental.

***Piaya cayana inexpectata*, subsp. nov.**

Type, No. 88,507, Collection Carnegie Museum, adult female; Sabana de Mendoza, Venezuela, April 29, 1922; M. A. Carriker, Jr.

Subspecific characters.—Similar to *Piaya cayana mehleri* Bonaparte of northern Colombia and Venezuela, but smaller, and general coloration paler; tail with the subterminal black areas of the rectrices reduced in extent, and the brown correspondingly increased. Similar also to *Piaya cayana circe* from the region southeast of Lake Maracaibo, but somewhat smaller, and general coloration decidedly paler, the under tail-coverts dusky grayish instead of blackish, and the tail with less black.

Measurements.—

Carnegie Mus. No.	Sex	Locality		
88507	♀	Sabana de Mendoza	Wing, 135; tail, 228	
88721	♀	Sabana de Mendoza	138	272
88722	♂	Sabana de Mendoza	136	250
90287	♂	La Azulita	137	230

Range.—Region east and south of Lake Maracaibo.

Remarks.—On geographical grounds one would expect to find *Piaya cayana* represented by the same race on the east side of Lake Maracaibo as on the west side, but not so. The east-side form is just as distinct from *circe* as it is from *mehleri*. In general coloration it resembles the latter, but is slightly paler; the upperparts are nearest Brussels brown; and there is less black on the tail; it is uniformly smaller. In size it is nearer *circe*, but in coloration it is markedly lighter. The La Azulita specimen is obviously intermediate between the present race and *circe*. And from Santa Elena, not many miles north of La Azulita, we have a perfectly typical example of *P. cayana mesura*, as already noted. Thus, in the Maracaibo Basin three easily distinguishable races of *P. cayana* appear to be endemic, but it does not yet appear what their inter-relationships may be. The problem demands further study in the field and the collection of much additional material for its solution.

PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW CANARY FLYCATCHER FROM THE
PHILIPPINE ISLANDS

BY H. G. DEIGNAN¹

Comparison of series of fresh-plumaged autumn and winter specimens of *Culicicapa helianthea* subsp. has shown that the population of Tawitawi Island is as distinct from *C. h. panayensis* of the more northern islands and Paláwan as the latter is from *C. h. helianthea* of the Celebes. I propose to name the new race

Culicicapa helianthea mayri, subsp. nov.

Type.—Adult male, U. S. National Museum No. 315319, collected at Tataán, Tawitawi Island, Sulu Archipelago, Philippine Islands, on October 15, 1891, by D. C. Worcester and F. S. Bourns (Menage Collection No. 1970).

Diagnosis.—From *C. h. panayensis* (and so much the more from *C. h. helianthea*) readily separable by having the olive green of the head and mantle paler and purer, less golden; the yellow of the rump band paler and less golden; the yellow of the under parts duller and greener, less golden.

Range.—Tawitawi and Bongao Islands.

Specimens in fresh plumage examined.—*C. h. panayensis*: 20; *C. h. helianthea*: 20; *C. h. mayri*: 6.

Remarks.—The new form is named for Ernst Mayr, co-author of "Birds of the Philippines."

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PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTONTWO NEW SPECIES OF TRICHOMORPHA FROM
PANAMA

BY RALPH V. CHAMBERLIN

The types of the two new species of the diplopod genus *Trichosoma* herein described were in a small collection of diplopods made in the Panama Canal Zone in 1946 by N. L. H. Krauss and by him transmitted to the author for study. In addition to the new forms several previously known species were also represented as listed below.

1. *Oxidus gracilis* (Koch)

Several males and females of this widespread species were taken at Summit in August, 1946.

2. *Trichomorpha kraussii*, new species

Body above and laterally black, the ventral area brown; keels and small area beneath each of them yellow to yellowish brown. Legs white or yellowish proximally and distally, with the middle articles darker, somewhat yellowish brown. Antennae brown or blackish brown except toward base. Head black, with clypeal area pale, white or nearly so.

Collum moderately narrower than the second tergite, the keels acutely acuminate ectad, with spical portion curved caudad; a single tooth or serrature on anterior margin as shown in fig. 1; apparently with several transverse series of short setae across dorsum, the setae well spaced but as the types are much rubbed the exact arrangement is in some doubt.

On ordinary tergites the keels are wide, rise above the level of the mid-dorsal area and curve caudad to an acute tip as shown in fig. 2; the teeth on caudal margins of keels of posterior segments from 4 to 6 in number; the caudal margin of anterior keels smooth, lateral serratures weakly developed. Dorsum of tergite with the usual deep transverse sulcus behind which the area may be partially divided by a few incomplete longitudinal or sublongitudinal sulci; two or three transverse series of well separated setae on each tergite.

Subtarsal pads present only on legs of first and second pairs and much reduced or abortive.

The features of the male gonopods are shown in figs. 3 and 4.

Width, 3.6 mm.

Locality.—Panama Canal Zone, Summit. Two males taken Nov. 2, and the female allotype taken in Oetaba, 1946.

3. *Trichomorpha fratrellus*, new species

A smaller form than *T. kraussi*. The dorsum is uniform brown with the keels not differing in color. Legs light yellow. The antennae with middle articles brown, the basal and apical ones pale yellow or nearly white.

Collum scarcely narrower than the second tergite, these two plates having the form and proportions shown in fig. 5. Setae few and widely separated.

Keels in general narrower than in the preceding species, with lateral margin straight and nearly parallel with body, smooth excepting the small tooth at anterior corner; posterior margin of posterior keels typically denticulate as shown in fig. 6.

Tarsal pads strongly developed on the anterior legs, but reduced on legs of eighth segment and absent caudad of this.

Gonopods of male as shown in figs. 7 and 8.

Width, 2.2 mm.

Locality.—Panama Canal Zone: Summit. One male taken November 2, 1946, along with the two males of *T. kraussi*.

4. *Oxygyge varicolor* Silvestri

One male referred to this species was taken on Tobago Id. on October 18, 1946.

5. *Rhinoericus*, sp.

A female of small size and at present of uncertain species was taken at Summit in October, 1946.

6. *Orthoporus* sp.

A female, not at present identifiable with certainty in the absence of the male, was taken on Flamence Id. on October 29, 1946.

7. *Siphonotus angulifer* Chamberlin

About a score of specimens of both sexes referable to this species were taken at Summit in October, 1946. The species was originally described from Barro Colorado Id.

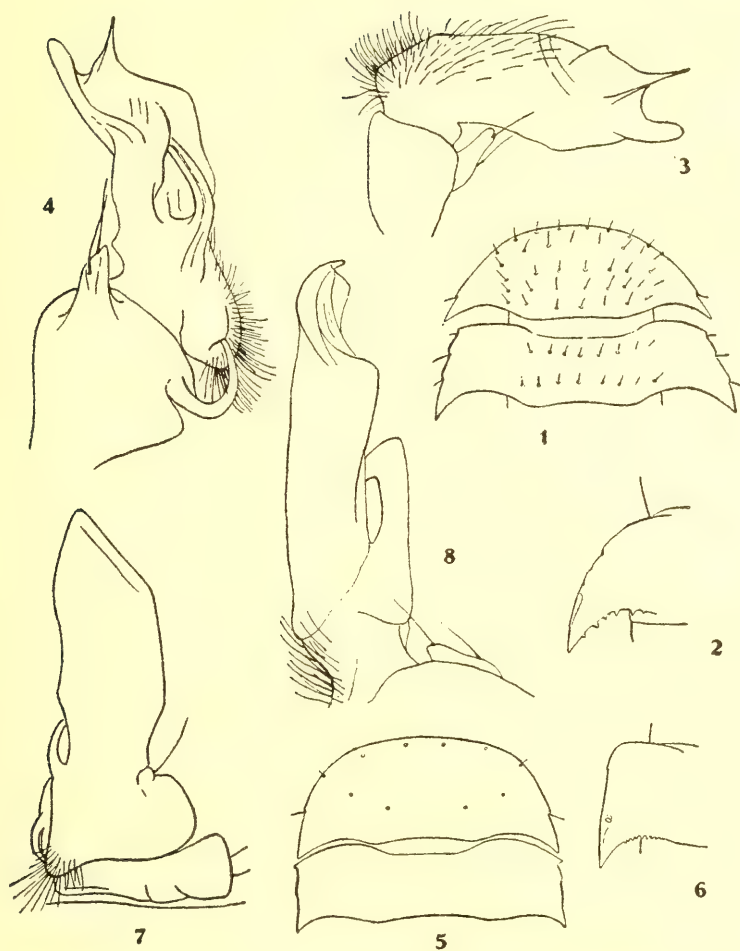
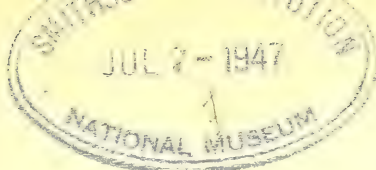


Plate II

Trichomorpha kraussi, n. sp. Fig. 1. Collum and second tergite in outline. Fig. 2. Fifteenth keel. Fig. 3. Left gonopod of male, ectal view. Fig. 4. The same, dorso-mesal view.

Trichomorpha fratellus, n. sp. Fig. 5. Collum and second tergite. Fig. 6. Fifteenth keel. Fig. 7. Left gonopod in situ, ventral view. Fig. 8. The same, ectal view.



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TWO NEW SOUTH AMERICAN PIGEONS

BY W. E. CLYDE TODD

In the course of identifying and rearranging the Pigeons and Doves (Family Columbidae) in the collection of the Carnegie Museum—a task recently completed—two apparently new subspecies were discovered, from Venezuela and Bolivia respectively. They are described and named herewith. Names of colors are taken from Ridgway's Color Standards and Color Nomenclature (1912).

***Columba cayennensis obsoleta*, subsp. nov.**

Type, No. 104,390, Collection Carnegie Museum, adult male; Pie del Cerro (La Victoria), Aragua, Venezuela, May 8, 1929; Ernest G. Holt.

Subspecific characters.—Similar to *Columba cayennensis cayennensis* Bonnaterra, but general coloration decidedly darker; forehead and upper back Hay's maroon (instead of carob brown); lower back and rump blackish plumbeous (not slate gray); lesser wing-coverts chestnut (not chestnut brown); and underparts also much darker, the abdomen and under tail-coverts duller and darker gray.

Range.—Northern Venezuela.

Remarks.—Three specimens (one adult male from El Trompillo, and one adult and one immature male from Pie del Cerro) agree in their dark general coloration—darker even than in *C. cayennensis sylvestris*, although they lack the distinctly bicolored tail of that race. They seem to represent a hitherto unrecognized subspecies, peculiar to the north coastal region of Venezuela. Hellmayr and Conover (Cat. Birds Americas, pt. 1, no. 1, 1942, 455), refer birds from this region to *C. c. pallidicrissa*, but apparently without having seen specimens. They are of course still more different from *pallidicrissa* than from typical *cayennensis*, although one would rather expect them to be intermediate between these two. Although I have but two adult specimens, their characters are so strongly marked by comparison that I have but little hesitation in separating them under a new name.

***Oreopeleia erythropareia loricata*, subsp. nov.**

Type, No. 50,668, Collection Carnegie Museum, adult female; Buena Vista (Rio Yapacani), Bolivia, August 29, 1914; José Steinbach.

Subspecific characters.—Similar to *Oreopeleia erythropareia erythropareia* (Salvadori) of eastern Ecuador, but forehead, cheeks, and subauricular region much paler (vinaceous buff instead of kaiser brown).

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Range.—Known only from the type-locality.

Remarks.—Unfortunately we have but a single specimen of this bird, but it is so strikingly different from *O. frenata frenata* from Incahaca, Bolivia, that I do not hesitate to describe it as new. It is much darker and browner throughout than *frenata*, and agrees well in these respects with the figure of the type-specimen of *O. erythropareia* in Selater and Salvin's *Exotic Ornithology*, 1869, pl. 40, except that the forehead and sides of the head (except the auriculars) are colored almost as in *frenata*. Coming as it does from a locality in the Tropical Zone of Bolivia, it probably represents a recognizable form allied to *erythropareia*—a bird whose status still remains uncertain because of lack of material, but which is probably also a Tropical Zone form. Comparison has been made with the plate, the essential accuracy of which has been fully verified by Chapman (*Bull. Am. Mus. Nat. Hist.*, 55, 1926, 173) and by Hellmayr (*Cat. Birds Americas*, pt. 1, no. 1, 1942, 620, note). The discovery here announced tends to validate the claims of *O. erythropareia* to specific rank.

PROCEEDINGS

OF

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW YELLOWTHROAT (*GEOTHLYPIS TRICHAS*) FROM THE NORTHERN ROCKY MOUNTAIN-GREAT PLAINS REGION

BY WILLIAM H. BEHLE AND JOHN W. ALDRICH

Working independently, Aldrich on the birds of Washington and Behle on the birds of Utah, the discovery was made that the population of yellowthroats in the Pacific Northwest east of the Cascade range and thence eastward to the Dakota region represents an undescribed race. Upon learning of each other's findings it was decided to collaborate in naming the new race, as follows:

Geothlypis trichas campicola, new subspecies

Northern Plains Yellowthroat

Type.—Adult ♂, No. 79842, University of California, Museum Vertebrate Zoology; Yellowstone River, 5 miles west Forsyth, 2,750 feet, Rosebud County, Montana; June 8, 1940; collected by W. C. Russell, original number 7262; weight 10.0 grams; testis 8 mm.

Subspecific characters.—Similar to *Geothlypis trichas occidentalis* of the Great Basin but upper parts grayer, less yellowish olive green; yellow of underparts less extensive posteriorly; belly and flanks grayer, averaging more whitish, less buffy. Similar to *G. t. arizela* of the humid coast belt west of the Cascade Range, but also grayer on upper parts; white frontal stripe broader; yellow of underparts slightly paler and less extensive; posterior underparts whiter, less buffy. In size intermediate between *occidentalis* and *arizela*.

Measurements.—Adult male (23 breeding specimens): wing, 52-60 (55.6); tail, 49.5-58 (51.5); exposed culmen, 10.5-12 (11.2); tarsus, 18.5-21 (19.7); middle toe without claw, 12-14 (13.1). Adult female (9 breeding specimens): wing, 50-54 (52.6); tail, 44-52 (47.8); exposed culmen, 10.5-11.5 (10.9); tarsus, 18-20 (19.4); middle toe without claw, 11.5-14 (13.0).

Geographic distribution.—Breeds east of the Cascade Mountains in northern Oregon, Washington, and British Columbia, thence east through northern Idaho, Alberta, Saskatchewan, Montana, northern Wyoming to northern North Dakota. In migration occurs southward in Utah, Colorado, and Arizona. Winter range undetermined.

Breeding specimens examined.—*British Columbia*: Clearwater Post-Office, 1; Indianpoint Lake, 1; Creston, Kootenay Valley, 1. *Washington*: Omak Lake, 1; Grand Coulee, 2; Pullman, 1; Rock Creek, 1; Yakima, 2;

MEASUREMENTS (♂) OF THREE RACES OF
GEOTHELYPIS TRICHAS

Subspecies	Wing	Tail	Exposed Culmen	Tarsus	Middle toe without claw
<i>G. t. arizela</i> (18 specimens)	53.5-58.0 (55.0)	49.0-56.5 (52.3)	10.0-12.0 (10.9)	19.0-22.0 (20.3)	11.5-14.0 (12.7)
<i>G. t. campicola</i>					
Great Plains (13 specimens) ..	52.0-57.5 (55.0)	45.0-55.5 (50.3)	10.5-12.0 (11.2)	18.5-20.5 (19.7)	12.0-14.0 (13.0)
East. Washington (10 specimens)	54.5-60.0 (56.3)	49.5-58.0 (53.3)	10.5-12.0 (11.1)	18.5-21.0 (19.9)	12.0-14.0 (13.1)
<i>G. t. occidentalis</i> (28 specimens)	54.0-61.0 (57.7)	49.0-58.0 (54.4)	10.4-12.5 (11.4)	19.0-20.9 (20.1)	12.5-15.0 (13.9)

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Sprague, 1; Kiona, 1; Walla Walla, College Place, 1; Wenatchee Lake, 1. *Oregon*: Juntura, 1; Sparta, 1. *Idaho*: 2 miles south Payette, between Payette and Snake Rivers, Payette County, 1; Coolin, Bonner County, 1. *Alberta*: Camrose, 1; Edmonton, 1; 9 miles above main branch, Athabaska Delta, 2. *Montana*: Lolo Creek, 6½ miles west Lolo, 3,470 feet, Missoula County, 1; Yellowstone River, 5 miles west Forsyth, 2,750 feet, Rosebud County, 4; Big Timber, 2; Crow Agency, 2; Powderville, 1; Spring Creek, 6,500 feet, Bighorn Mountains, 1; Bozeman, 1; Glasgow, 3; Darnall's, 1; Lismas, 3; Lane Deer, 1; Hilger, 1; Zortman, 1. *Wyoming*: Black Mountain, Head of Pat O'Hara Creek, 2; Two Ocean Lake, 1; Greybull, 1; Muddy Creek, 1. *North Dakota*: Towner, 1; Tokio, 1; Medora, 2; Buford, 1; Larimore, 1; Fort Rice, 1; Oaks, 1; Bismarck, 1 (intergrade).

Remarks.—Many years ago the whole western population of yellowthroats was described and named *G. t. occidentalis* by Brewster (Bull. Nuttall Ornith. Club, 8, 1883: 158). An adult male in the Brewster collection from Truckee River, Nevada, May 4, 1881, was designated as the type. In 1899, Oberholser (Auk, 16: 257) separated as a distinct race *G. t. arizela*, the yellowthroats of the northern Pacific Coast region. The type selected was an adult male in the U. S. National Museum from Fort Steilacoom, Washington, collected on May 13, 1856. Subsequently, Swarth (Univ. Calif. Publ. Zool., 10, 1912: 71-73), in reporting on a collection of birds from Vancouver Island, was unable to distinguish his series of yellowthroats from birds taken in the Pine Forest Mountain in western Nevada, and, therefore, placed *arizela* in the synonymy of *occidentalis*.

Rexamination of Swarth's two series, together with study of much additional material, has led to the conclusion that the yellowthroats of the coastal region of the Pacific Northwest, west of the Cascade Mountains, are sufficiently different from the Great Basin population to justify the recognition of *arizela*, but with a much less extensive range than Ridgway (Bull. U. S. Nat. Mus. 50, Pt. 2, p. 670) indicated. *G. t. arizela* differs from the Great Basin form, *occidentalis*, in slightly smaller size, darker green back, and narrower white forehead stripe. The yellow of the underparts is greener, less orange, and the flanks less buffy.

Gabrielson and Jewett (Birds of Oregon, 1940: 12) also have recently noted that the yellowthroats west of the Cascade Mountains were different from those to the east of this range in Oregon. This discovery led these authors to consider *arizela* as a recognizable race. We not only concur with them in their findings but may comment further that the eastern Oregon population is somewhat intermediate between the races *occidentalis* and *campicola*.

The remarks of Grinnell and Miller (Pacific Coast Avifauna, 27, 1944: 411-413) on the distribution of yellowthroats in northern California west of the Sierra Nevada south to the San Francisco Bay region (occupied by the race *sinuosa*), and the area of intergradation with *scirpicola* in the Great Valley, apply for the most part to *arizela*, rather than *occidentalis*, which breeds only east of the Sierra Nevada.

During the course of the present study the type specimens of both *arizela* and *occidentalis* have been examined and both prove to be representative of the breeding populations of the regions whence they came.

It was especially necessary to consider the possibility that the type of the race *occidentalis*, taken early in May, might have been a migrant of either of the two races of more northern distribution. We are indebted to Mr. James L. Peters for the opportunity of examining the type of *occidentalis*, which is now in the Museum of Comparative Zoology at Harvard College. Indeed, we are indebted to the curators of many collections for the loan of comparative material used in this study.

Apparently the northern Rocky Mountains do not constitute a serious isolating barrier between the yellowthroats of eastern Washington and those of the northern Great Plains region, since there is no significant difference between these two populations. There is a slight approach of the eastern Washington birds to the race *arizela*, but they resemble much more closely the northern Great Plains group. Throughout southern Idaho, southern Wyoming, southern North Dakota, *campicola* intergrades with *occidentalis* and along its eastern margin in North Dakota there is probably an area of inosculation with *brachidactyla*.

University of Utah, Salt Lake City, Utah; and Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C.

SMITHSONIAN INSTITUTION
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PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTONA NEW SPECIES OF *Aedes* (*Christophersiomya*) FROM THE PHILIPPINES (DIPTERA: CULICIDAE)¹

BY KENNETH L. KNIGHT, Lt. Comdr., H(S), USNR

The subgenus *Christophersiomya* has previously been known only from Ceylon and India. It contains the following three species: *thomsoni* (Theobald), *annulirostris* (Theobald), and *ibis* Barraud. These included species resemble the members of the subgenus *Stegomyia* in general appearance. The most distinctive characters of the subgenus *Christophersiomya* are the presence of short palpi in both sexes, the white-marked proboscis, the narrow scales on *apn*, and the undivided mesosome.

I have had the opportunity of examining all of the types (but unfortunately not of comparing the specimens of the new species described here with them), which are all deposited in the British Museum, but cannot add anything of value to Barraud's² (1934) treatment of the subgenus. However, his key to adults is enlarged here to include the new species. No key to larvae is possible, since only the larva of *thomsoni* is known with certainty. There are apparently almost no male genitalie differences between the known species of the subgenus.

Aedes (*Christophersiomya*) *brayi*, new species

Figs. 1, 2

ADULT. *Male*. Wing approximately 2.7 mm. in length. *Head*:—Proboscis equal to the fore femur in length; black-scaled, a narrow ventral and lateral white area just beyond the middle, apical two-fifths white ventrally, no pale scaling visible dorsally. Palpus only 0.27 as long as the proboscis, black-scaled. Torus with broad white scales mesally. Vertex with broad white scales, a sublateral patch of broad black scales on a level with *apn*; a narrow band of short dusky upright forked scales on the nape.

¹This is the eighth paper of a series prepared on the mosquitoes of the Philippine Islands, a project begun under the auspices of U. S. Naval Medical Research Unit No. 2. The work was carried out in space furnished by the Division of Insects, U. S. National Museum. It is a pleasure to express my thanks to Mr. F. E. Baisas, Bureau of Health, Republic of the Philippines, for making available to me both the material and the drawings for the new species described here.

²Barraud, P. J. Th Fauna of British India: 5:212-215. Taylor and Francis, London.

Thorax.—Scutal integument dark brown; no acrostichal, dorso-central or prescutellar bristles present; densely clothed with narrow and narrow-curved white scales, a small median divided area of dusky scales immediately before the prescutellar space; a patch of large broad white scales just before the wing base on the lateral margin of the scutum. Scutellum with a dense patch of broad white scales on each lobe. *Apn* covered with narrow white scales, these broader ventrally; *ppn* covered with white scales, narrow-curved dorsally, broad below (1 bristle present). Following pleural areas each with a patch of broad white scales: proepisternum, subspiracular, paratergite, prealar (below the knob), upper sternopleural, ventro-posterior sternopleural, mesepimeron (most of upper three-fourths). One lower mesepimeral bristle present. Coxae with broad white scales, fore with a large median area of dusky scales. Fore femur dark, with anterior surface marked by an elongate sub-basal ventral white area and a ventral subapical white spot (also a few dorso-apical white scales), these white markings extending across the ventral margin and broadly continued on the posterior surface; mid femur dark, with anterior surface marked by a thin elongate sub-basal ventral white area and by a prominent apical band, these markings extending across the ventral margin and broadly continued on the posterior surface, the apical ring incomplete there however; hind femur white, marked anteriorly by a small basal dark area and by a thin dorso-apical dark line, posterior surface with a small basal dark area, apical two fifths all dark except for ventral margin; both mid and hind femora with some black scales at extreme apex of anterior surfaces. Fore tibia dark anteriorly, white posteriorly; mid tibia dark, numerous grayish scales present posteriorly; hind tibia with basal two-fifths ventrally white, this pale area distinctly extended onto the anterior surface. Fore tarsus dark; mid tarsus with some basal white scales on I; hind tarsus with narrow basal white bands on I-III. Tarsal claws small, all equal, each unidentate. Wing dark scaled, a small white scaled spot at the base of the costa; crossvein 4-5 considerably basad of crossvein 3-4. Halter stem pale, knob dark scaled.

Abdomen.—Tergites black; I with a lateral white band; II-VII marked with a small medio-basal white patch, and by a large basolateral white area, this latter area extending posteriorly and dorsally. Sternites white, with black apical bands. Genitalia as figured (Plate III, Fig. 1 Tergal aspect; Fig. 2 Basal lobe of basistyle).

Female. Wing approximately 2.9 mm. in length. Largely similar to the male. However: vertex dark scaled except for a median area and for a line along the eyes, both of which are white scaled. Scutum with posterior one-half largely dark scaled, some pale scales along the prescutellar bare space and over the wing base. Scutellum with lateral lobes dark scaled, mid white. Mid tarsi with a narrow basal white area on I-II. Sternite VII dark. Segment VIII retracted; cerci retracted.

LARVA. Unknown.

TYPES. *Holotype*. Male (F280 (b)-x), with genetalic slide mount (U.S.N.M. Cat. No. 58429), San Jose, Nueva Ecija Province, Luzon, Philippines, September 15, 1945 (D. Bray), reared from a stream rock pool.

Paratype. One female (F280 (b)), same data as for holotype (deposited in U.S.N.M.).

REMARKS. This species is most closely related to *ibis* (known only from a single female). However, the latter species (using the type description) is distinct as follows: the pale band on the proboscis extending onto the dorsum where it is interrupted medially (no mention is made in the type description of a ventro-apical white marking being present); scutellar scales dark and pale intermixed; mid femur black except for a broad white marking anteriorly very near the apex; tarsi with small pale basal markings on each of the first 3 segments; and, tergites IV-VII with median basal white markings.

This species is dedicated to its collector, Mr. Dale Bray. The specimens were received via Mr. F. E. Baisas, to whom I tender my sincere appreciation.

Key to the Adults

1. Hind tibia with a white ring on basal one-half.....*thomsoni* (Theobald)
Hind tibia without a white ring on basal one-half..... 2
2. Fore femur dark, except for a white mark near base on posterior surface (beneath)*annulirostris* (Theobald)
Fore femur also with a white mark on apical one-half of anterior surface, connected across the ventral margin with a white streak on the posterior surface 3
3. Proboscis with white scaling well visible dorsally; mid femur black except for a broad white marking anteriorly near the apex; fore tarsus with basal pale scaling on the first 3 segments*ibis* Barraud
Proboscis all dark dorsally; mid femur with anterior surface marked by a thin elongate sub-basal ventral white area and by a prominent apical band, these markings extending across the ventral margin and broadly continued on the posterior surface; fore tarsus dark*brayi* new species

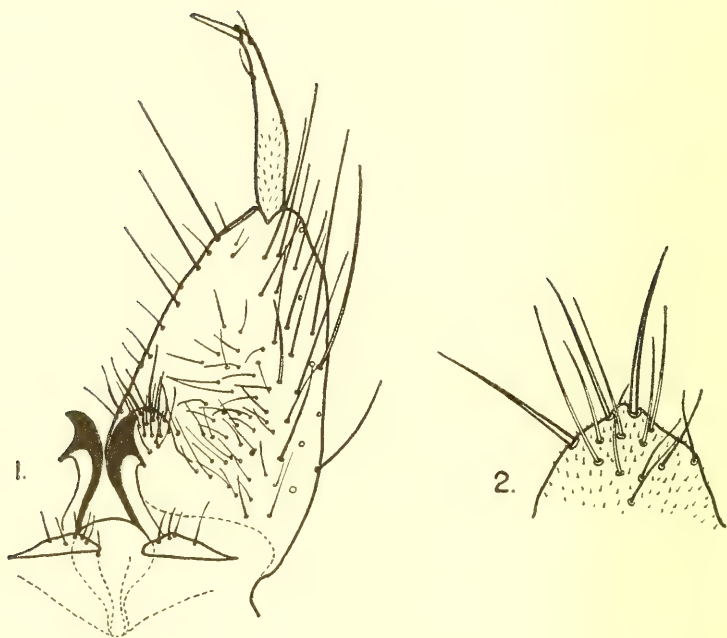


Plate III

Aedes (Christophersiomyia) brayi

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A NEW FLYCATCHER FROM THE WESTERN UNITED STATES

BY HARRY C. OBERHOLSER

Since the writer separated *Empidonax traillii adastus*, still another and apparently undescribed subspecies seems recognizable. The population of this species inhabiting the Pacific coast region in North America, from southwestern British Columbia to western California it is now proposed to consider as an additional race, which may be called:

***Empidonax traillii zopholegus*, subsp. nov.**

Subspecific characters.—Similar to *Empidonax traillii adastus*, but smaller; darker, more brownish (less grayish) above; and breast also darker.

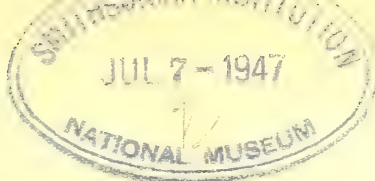
Measurements.—Adult male. Wing, 66-71.8 (average, 68.5) mm.; tail, 55-62 (58.7); exposed culmen, 11-13 (11.7); tarsus, 16-17.8 (17); middle toe without claw, 9-10 (9.6). Adult female. Wing, 60.5-68 (average, 65.6) mm.; tail, 53.5-59 (56.3); exposed culmen, 11-12 (11.7); tarsus, 15.5-17.5 (16.4); middle toe without claw, 8.5-10 (9.2).

Type.—Adult male, No. 47174, Cleveland Museum of Natural History; South Vancouver, British Columbia, Canada; June 1, 1928; R. A. Cumming.

Geographic distribution.—Breeds in the Pacific coast region of North America, from southwestern British Columbia through western Washington and western Oregon to western California; south to Marin County, central western California. Winters in Mexico (probably) and south to Bonda, Colombia, in South America.

Remarks.—At the northern part of its range this bird shows no evidence of intergradation with *Empidonax traillii traillii*, the range of which it meets in southwestern British Columbia, where it is apparently typical at Vancouver; and the birds from the coast of northern Oregon are the same. A series of more than 30 birds of this race has been examined. Average measurements of males in millimeters of *Empidonax traillii adastus* are for comparison given here: wing, 71.8; tail, 60.6; exposed culmen, 12.1; tarsus, 17.4.

With the addition of this race there are now 4 recognizable subspecies of *Empidonax traillii*, which are as follows: *Empidonax traillii traillii* (Audubon), *Empidonax traillii brewsteri* Oberholser, *Empidonax traillii adastus* Oberholser, and *Empidonax traillii zopholegus* Oberholser.



PROCEEDINGS
OF
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A NEW ABERT SQUIRREL FROM UTAH

BY STEPHEN D. DURRANT AND KEITH R. KELSON

The senior author recently reported the occurrence of *Sciurus aberti* in southern Utah (Durrant; Jour. Mamm., 28: 66, Feb. 15, 1947). This constituted the first record of the genus known to us from the state. A second specimen was subsequently obtained from the same approximate locality. A comparison of these animals with topotypes and near topotypes of the known races of *Sciurus aberti* indicates that they represent an heretofore unknown race. The name and description of the new form are as follows:

Sciurus aberti navajo, new subspecies

Type.—Male, adult, skin and skull, No. 4775, Museum of Vertebrate Zoology, University of Utah; 1 mi. E Kigalia Ranger Station, 30 mi. W Blanding, Natural Bridges National Monument Road, 8,000 feet, San Juan County, Utah; September 10, 1946; collected by George F. Edmunds and Irving B. McNulty.

Range.—Known only from the type locality.

Diagnosis.—Size medium; hind feet short. Color: Upper parts a grizzled Iron Gray due to black and white banded hairs grading to pure black on the sides; (capitalized color terms according to Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912); dorsal stripe Cinnamon Rufous, confined to posterior regions, and nearly obsolete; ear tufts short and black; postauricular spots Cinnamon Rufous and much reduced in size; upper parts of head and especially the sides of head grading to white on lips and eye ring; vibrissae black; dorsal parts of tail same as upper body parts, but overlaid with long, white-tipped guard hairs; sides of tail broadly edged in white; underparts white, the hairs being Dark Plumbeous at base except on the forelegs; ventral surface of tail white (hairs white to the roots) except the proximal portion of the tail which is the same grizzled gray as the upper parts; dorsal and outer surfaces of legs to tarsal and carpal joints same as upper parts, white below. Skull: Supraorbital ridge with very deep notch; foramen magnum ovoid, not vaulted; lambdoidal crest plate-like rather than ridged; braincase broad and well inflated.

Measurements.—The measurements in millimeters of the available adult male specimens are as follows, those of the type being first: Total length, 486,510; tail vertebrae, 220,231; hind foot, 67,74; ear, 31,44; occipito-

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nasal length of skull, 60.6, 61.0; zygomatic breadth, 37.1, 35.4; nasal length, 20.6, 21.0; basilar length (Hensel), 47.0, 46.4; palatal length, 26.7, 26.4; cranial depth, 19.2, 18.8; alveolar length of maxillary tooth row, 11.0, 11.5.

Comparisons.—The specimens of *Sciurus aberti navajo* may be distinguished from fall and winter taken topotypes of *S. a. mimus*, which it resembles most closely, as follows: Size: Slightly larger; ear tufts shorter (taking cognizance of seasonal change). Color: Darker, blackish undertone as opposed to brownish; lateral stripes and ears darker (black); Cinnamon Rufous of posterior upper parts more reduced; postauricular patches smaller. Skull: Notch in supraorbital ridge more pronounced; foramen magnum ovoid rather than vaulted; lambdoidal crest flattened and plate-like, rather than crested; rostrum wider (9.6 mm. as opposed to 9.2 mm. in comparable males); basilar length greater (46.7 mm. as opposed to 45.8 mm.); nasals longer (20.8 mm. as opposed to 19.7 mm.); maxillary tooth row slightly longer (11.25 mm. as opposed to 10.90 mm.).

Compared to topotypes and near topotypes of *Sciurus aberti chuscensis*, the nearest geographic race to the south, *S. a. navajo* may be recognized as follows: Size: Smaller. Color: Upper parts blackish without brownish undertone; Cinnamon Rufous dorsal area much reduced. The specimens of *S. a. chuscensis* are summer specimens and, therefore, a comparison of ear tufts is not feasible. Skull: Sphenopalatine vacuities smaller; foramen magnum ovoid rather than vaulted; notch in supraorbital ridge deeper; breadth of braincase slightly greater at level of auditory meatus (25.3 mm. as opposed to 24.7 mm.).

From late summer and fall topotypes of *Sciurus aberti aberti*, *S. a. navajo* may be distinguished as follows: Color: Darker, no brownish and cinnamon undertone, especially on ears and sides; Cinnamon Rufous dorsal area greatly reduced, being nearly obsolete as opposed to well developed; ear tufts much shorter in specimens of the same season; hind feet shorter (70.5 mm. as opposed to 75 mm.). Skull: Palate shorter (26.5 mm. as opposed to 27.2 mm.); braincase broader at level of auditory meatus (25.3 mm. as opposed to 24.5 mm.); postorbital constriction greater (19.35 mm. as opposed to 18.6 mm.).

Sciurus aberti navajo may be distinguished from topotypes and near topotypes of *S. a. ferreus* as follows: Size: Larger. Color: *S. a. ferreus* is known to occur in several color phases ranging from Blackish Brown (1) to the gray phase resembling other Abert squirrels. Compared to the gray phase, *S. a. navajo* may be distinguished by its lack of the brownish undertone; Cinnamon Rufous dorsal area reduced, but quite absent in *S. a. ferreus*; short pure black ear tufts as opposed to the long brownish tufts; white tail border more marked. Skull: Foramen magnum flattened and less vaulted; notch in supraorbital ridge more pronounced; rostrum wider (9.6 mm. as opposed to 9.1 mm.); basilar length greater (46.7 mm. as opposed to 45.3 mm.); occipitonasal length greater (60.8 mm. as opposed to 58.4 mm.); zygomatic breadth greater (36.2 mm. as opposed to 34.9 mm.); post orbital constriction greater (19.35 mm. as opposed to 18.20 mm.); braincase wider at level of auditory meatus (25.3 mm. as opposed to 24.4 mm.); nasals longer (20.8 mm. as opposed to 19.7 mm.); maxillary tooth row slightly longer (11.25 mm. as opposed to 10.8 mm.).

Remarks.—It is quite remarkable that the presence of an animal as large and spectacular as an Abert squirrel could remain unknown so long to Utah collectors. The known range of this race is, however, fairly remote and until recent years almost inaccessible. Messrs. Julian Thomas and Tom Phillips, U. S. Forest Rangers of the La Sal National Forest who obtained one specimen and were instrumental in securing the other, report that the animals are nowhere common and the range is quite restricted. These facts also, no doubt, contributed to the delayed discovery of the race.

The type locality is a broad flat-topped tableland abutting on the west slope of the Abajo Mountains in San Juan County. This highland area is completely isolated from any other mountains by the tangled canyons of the Colorado River and its feeders to the west, by sage plains to the south and east, and by mixed-shrub desert to the north. The Abert squirrels, it will be recalled, evidence one of the closest associations with a specific vegetative type of any mammal. They seem to be entirely dependent upon the yellow pine which is their chief source of food supply; they are not known to occur in any situation where these trees are not present. Hence the distribution of known races of *Sciurus aberti* is largely a series of isolated populations correlated with small discontinuous stands of yellow pine. It seems apparent that the present distribution of these forests is a result of past climatological change which at one time permitted the existence of "bridges" of yellow pine across what is now arid desert land, thus affording a possible means of dispersal to the squirrels. With reference to past climatic conditions, it is recognized that much of the higher part of this southern Utah country supported glaciers (Gregory, U. S. Geol. Surv., Prof. Pa. no. 188:64, 1938). At least the presence of certain relict flora of the region is mute evidence of a different past climatic situation.

Inasmuch as these squirrels remained so long undetected in Utah, perhaps other isolated populations will be found when the yellow pine associations of similar desert mountains in this region are more thoroughly studied.

Specimens examined.—2; *San Juan County*: 1 mi. E Kigalia Ranger Station, 30 mi. W Blanding on Natural Bridges National Monument Road, 8,000 feet (type locality), 1; Elk Ridge, La Sal National Forest, 8,000 feet, 1.

Contribution from the Department of Biology, University of Utah, Salt Lake City, Utah.

PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON SOME PARASITIC MITES OF THE
SUPERFAMILY PARASITOIDEA, WITH A KEY TO
THE AMERICAN GENERA OF THE LIPONYSSINAE

H. E. EWING

The following notes comprise a very small start toward clearing up the confused synonymy of an important economic group of parasitic mites. Some of the species here treated were described almost a century ago before adequate facilities for studying such small arachnids were available, such descriptions being totally inadequate for present day purposes. Then, added to this handicap, we find other difficulties such as the lack of proper knowledge of generic and specific characters, and much confusion due to individual variations.

Eulaelaps stabularis (C. L. Koch) in North America

In recent years there have accumulated in the United States National Museum many lots of mite specimens regarded as representing *Eulaelaps stabularis* (C. L. Koch). Originally this material was identified by comparison with Oudemans's (1913, p. 193) figures and descriptions of the female. Later the identification was confirmed by the writer through the examination of similar specimens taken on *Apodemus sylvaticus* at Torrington, Devonshire, England. There is considerable individual variation among these specimens. In the female the jugularia (Pl. IV) may be very small and poorly sclerotized or large and well sclerotized (even united), the arching of the posterior margin of the sternal plate may be slight or considerable, and the anal plate (Pl. IV) may be strongly or slightly outcurved along its anterior margin.

With the aid of E. W. Baker, I have checked certain characteristics observed to differ in this material taken in America and England, from Oudemans's (1913, p. 192) drawings. Examinations showed that in all female specimens the jugularia are present, that there are only six sternal setae (Pl. IV), that there is an outcurving of the anterior margin of the anal

plate and finally, in all specimens, that the anal plate has but three setae, two adanal and one postanal.

Our American specimens and the four we have from England do not show certain characters reported by Turk (1945, p. 136) for *E. stabularis* in his interesting paper on "Studies of Acari. Second series etc.", such as the presence of two setae on the fixed arm of the chelicera in the female, the absence of the jugularia from certain females, and the presence of five setae on the anal plate. Further, all of the females observed were found to be of a single type as is true of related species of Laelaptinae.

Atricholaelaps virginianus (Ewing) 1925 =
Atricholaelaps glasgowi (Ewing) 1925

Specimens of *Atricholaelaps glasgowi* (Ewing) from various parts of the country and from different hosts show slight variations in size, body shape, relation of sternal width to sternal length, and in degree of sclerotization. Much of this variation is probably due to the age of the specimen when collected or to the method of mounting. Only a careful study of a large series of specimens all being mounted in the same manner would eliminate the confusion of individual variations with those, if any, that may be due to host or geographical distribution. A restudy of the types of *A. virginianus* and *A. glasgowi* has convinced me that they represent a single species. Hence, *virginianus* is here reduced to the synonymy of *glasgowi*.

The Genera *Macronyssus* Kolenati 1858 and
Liponyssus Kolenati 1858

Hirst (1921) made a major contribution to our knowledge of the Liponyssinae by giving good descriptions and excellent drawings (the latter by Terzi) of a large number of species, including some described by Kolenati, for which Hirst had type material. He recognized only one of Kolenati's genera in the Liponyssinae, the genus *Liponyssus*, but gave no description of its type species, *setosus* Kolenati. He did give, however, a good description and drawing of a type specimen (male) of the type species of *Macronyssus*, *Caris longimana* Kolenati 1857. In regard to the male type specimen of *longimanus* Hirst states: "It seems probable to me that this mite is the male of *Liponyssus ellipticus* Kolenati, but it is better

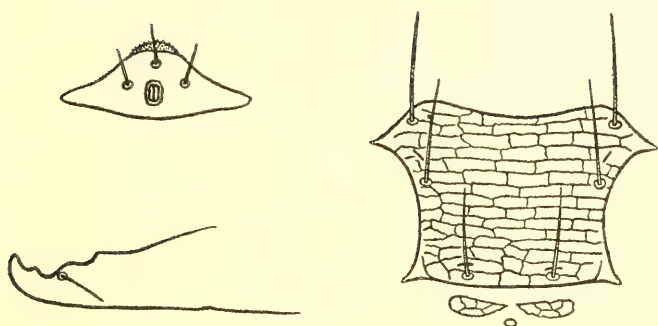


Plate IV. Detail drawings of the female of *Eulaelaps stabularis* (C. L. Koch) made from specimens taken on *Apodemus sylvaticus* in England: At left; sternal region. (Note particularly the paired jugularia at the top and the two pairs of dermal pores, one posterior to anterior setae and one posterior to second pair of setae.) Upper right; fixed chela of chelicera. Lower right; anal plate. (No more than three setae were found on the anal plate of any female.) Drawings not equally enlarged.

to keep the names separate until proof of this is forthcoming."

A comparison of Hirst's excellent drawing of the female of *ellipticus* with that given by Kolenati of the female of *longimanus* shows that in it the shoulders are not developed and the legs are not stout, hence this supposition by Hirst would appear to the writer hardly justified.

Acarologists for many years regarded *Macronyssus* Kolenati as a synonymy of *Liponyssus* Kolenati. Yet Oudemans (1936, p. 274) held *Macronyssus* to be a good genus,—first, because it had page (or line) precedence over *Liponyssus* Kolenati and second, because the species on which the latter monotypical genus was based, *Liponyssus setosus* Kolenati, was totally different from the two species originally included in *Macronyssus*. If the genus *Macronyssus* is considered zoologically equivalent to *Liponyssus*, its status would depend, according to the rules of nomenclature, upon the first revisor rather than upon a page (or line) precedence. In regard to Oudemans' second contention that the type species of *Liponyssus*, *L. setosus*, is very different from *Macronyssus*, there is room for a divergent opinion. He did not give any taxonomic character by which the two genera could be separated.

Kolenati (1858, p. 5) separated his genus *Macronyssus* not only from *Liponyssus* but from the genera of Liponyssinae in the first couplet of his key which is as follows:

"Die Palpen eben so lang als die Fühler, die Vorderfüsse länger

Genus, *Macronyssus* Klti.....1

"Die Palpen kürzer als die Fühler, die Vorderfüsse in gleicher Länge mit dem andern.....2"

This separation by Kolenati would not be sufficient today for a generic identification, hence it appears to the present writer that the status of *Macronyssus* yet remains in doubt, it probably being a synonymy of *Liponyssus* as regarded by Vitzthum (1941, p. 771).

The Genus *Bdellonyssus* Fonseca 1941

Fonseca (1941, p. 262) has divided the genus *Liponyssus* Kolenati, *sensu strictu*, by establishing the genus *Bdellonyssus* with *Liponyssus bacoti* (Hirst) 1913 as type species. Because of our inadequate knowledge of the type species of *Liponyssus*, *L. setosus* Kolenati, as well as that of the species contained in *Macronyssus* Kolenati it is hard properly

to evaluate this proposed new genus. Zoologically this genus appears to be a synonymy of *Leiognathus* G. Canestrini 1885. This name, however, is preoccupied by *Leiognathus* Lacepède 1802, a genus of fishes. For the present *Bdellonyssus* is regarded as a subgenus of *Liponyssus*.

Lepronyssoides sternalis (Hirst), new combination

Fonseca established the genus *Lepronyssoides* in 1941 for *Liponyssus pereirai* Fonseca 1935, a species in which the sternal plate of the female bears a pair of infundibuliform organs and the genitoventral plate a single pair of setae. This genus should be broadened to include *Liponyssus sternalis* Hirst 1921, a species in which the sternal plate of the female also bears a pair of infundibuliform organs, but the genitoventral plate has three pairs of setae.

(*Liponyssus canadensis* Banks 1909) = *Liponyssus sylviarum*
(Canestrini and Fanzago) 1877

Since the publication of my description of *Liponyssus canadensis* Banks (Ewing, 1922, p. 21) an examination of the types taken many years ago has convinced me that this species is a synonymy of *Liponyssus sylviarum* (Canestrini and Fanzago) 1877, which is known under the common name of the northern fowl mite. It is noted that the description published in 1922 was based in part on one lot of thirteen specimens taken from a chicken at Framington Center, Massachusetts. Furthermore, it has been established from the study of many lots of *L. sylviarum* that apparently only a single species of *Liponyssus* is found on chickens in the northeastern part of the United States and southern Canada.

(*Liponyssus americanus* Banks 1906) =
Liponyssus sylviarum (Canestrini and Fanzago) 1877

Recently the type specimens of *Liponyssus americanus* have been reexamined by E. W. Baker and the writer. We found that the characters of the dorsal and the sternal plates could be seen sufficiently well to show that this species is a synonymy of *Liponyssus sylviarum* (Canestrini and Fanzago).

Key to the American Genera of Liponyssinae

- | | |
|--|---|
| 1. Female with two dorsal plates..... | 2 |
| Female with a single dorsal plate..... | 3 |

2. Posterior dorsal plate of female large, covering much of abdomen
Steatonyssus Kolenati 1858
 (Type [sy synonymy]: Either *Liponyssus musculi*
 (C. L. Koch) 1936 or *Liponyssus vespertilianis* (Dugès))
 Posterior dorsal plate of female minute.....*Ophionyssus Mégnin* 1884
 (Type: *Dermanyssus natricis* Gervais 1844)
3. Legs all stout; first and second femora with spinelike setae above;
 dorsal plate of female almost or entirely covering body
Ichoronyssus Kolenati 1858
 (Type: *Ichoronyssus scutatus* Kolenati 1858)
 Legs sometimes stout, usually first, third or fourth much more
 slender than second; dorsal plate of female usually smaller..... 4
4. Sternal plate of female with a pair of infundibuliform organs
Lepronyssoides Fonesca 1941
 (Type: *Lipponyssus pereirali* Fonesca 1935)
 Sternal plate of female without infundibuliform organs..... 5
5. Coxa one with a spine-bearing tubercle on ventral surface
Neoichoronyssus Fonesca 1941
 (Type: *Lipponyssus wernecki* Fonseca 1935)
 Coxa one without a spine-bearing tubercle..... 6
6. Sternal plate of female with a heavily sclerotized and pigmented
 band along posterior margin. Male with second pair of legs greatly
 enlarged and fourth femur with a very large spine
Chiroptonyssus Augustson 1945
 Type: (*Chiroptonyssus texensis* Augustson 1945) =
Liponyssus robustipes Ewing 1925
 Sternal plate of female without a sclerotized and pigmented band
 along posterior margin. Fourth femur of male without large
 spine.....*Liponyssus Kolenati* 1858
 (Type: *Liponyssus setosus* Kolenti 1858)
 Also with a subgenus.....*Bdellonyssus Fonseca* 1941
 (Type of subgenus: *Leiognathus bacotti* Hirst 1913)

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PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTONTWO EXOTIC NEW FULGOROIDEA FROM THE
NEW WORLD

BY R. G. FENNAH

The following descriptions are based on material examined by the writer in the collection of the British Museum (Natural History).

Family ISSIDAE.

ORONOQUA gen. nov.

Vertex in middle line twice as long as pronotum in same line, approximately quadrate, much produced before eyes, anterior margin truncate or very shallowly concave, lateral margins subparallel, sinuate, posterior margin angulately excavate, width at apex equal to width at base, disc hollowed out medially. Frons longer in middle line than broad (2:1), basal margin V-shaped, lateral margins concave diverging to below level of antennae then incurved to suture, median carina absent, suture approximately transverse; disc flat, distinctly tumid in middle line at base, and obliquely raised laterally at level of antennae; clypeus tricarinate. Pronotum with anterior margin subangulately convex, posterior margin transverse; mesonotum broader than long, disc flat, lateral carinae distinct, meeting in a broad curve anteriorly, diverging posteriorly. Post-tibiae with two spines.

Tegmina with Sc + R forking near basal cell, M forking about level with union of claval veins, Cu 1 simple, about 14 short apical areoles, about six irregular ranks of polygonal subapical cells, nodal line more or less definite, one or two transverse veins in corium; costal margin shallowly convex, apical margin broadly rounded. Wings not proportionately very large, Sc with approximately 4 cells at margin, R with 2, M with 3, Cu 1a with 2, post-claval vein with 5.

Anal segment of female deflexed beyond orifice at an angle of 45°. Ovipositor with third valvulae broader than long, apical margin membranous.

Genotype, *Oronoqua deina* new species.

Oronoqua deina new species.

Female. Length 8.6 mm.; tegmen 9 mm.

Tawny yellow; a bar on each side of middle line of vertex, pronotum and mesonotum, basal angles and margins of tumescence on frons, lateral margins near antennae, middle line of clypeus, apex of rostrum, two spots in lateral fields of pronotum and of mesonotum, a bar between eyes and anterior margin, anterior portion of tegulae, a few bars on

pleurites, apices of pro- and mesofemora and pro- and mesotarsi, lateral margins of tibiae, lateral and posterior margins of abdominal tergites, anal segment, distal half of third valvulae piceous. Tegmina hyaline, veins brownish, fuscous at M fork from near stigma across to middle of membrane, apical margins, apex of clavus, sutural margin and base of main veins infusate. Wings hyaline, veins brown.

Described from one female collected on the Oronoqua River, British Guiana, Oct. 16, 1937. BM 1938-319. Type in British Museum.

The genotype bears a superficial resemblance to a Dictyopharid. It differs from *Thionissa* Metcalf in the shape of the apex of the vertex, the profile of the head, the shape of the tegmina and the venation; from *Thioniamorpha* Metcalf in the shape of the frons, profile, tegmina and the venation, and from *Thioniella* Metcalf in the relatively narrower body, the shape of the vertex and frons, the shape of the tegmina and the venation, and from *Acrisius* Stål in the same characters.

Family KINNARIDAE

MICROISSUS gen. nov.

Vertex about as broad as long, anterior margin not carinate, curving uninterruptedly into frons, lateral margins concave, posterior margin shallowly concave, median carina distinct pereurrent from occiput to frontoclypeal suture; frons longer than broad (about 1.2:1), lateral margins almost straight, diverging to level of antennae thence incurved to suture, lateral margins distinctly carinate, disc in profile shallowly convex; clypeus laterally carinate, devoid of median carina. Pronotum as long as vertex, anterior margin shallowly convex, posterior margin sinuate, shallowly concave medially; mesonotum broader than long with three subparallel carinae.

EXPLANATION OF FIGURES (Plate V)

1. *Oronoqua deina* Fenn., vertex, pronotum and mesonotum.
2. *Oronoqua deina* Fenn., head, front view.
3. *Oronoqua deina* Fenn., profile.
4. *Oronoqua deina* Fenn., tegmen.
5. *Oronoqua deina* Fenn., wing.
6. *Oronoqua deina* Fenn., anal segment and third valvulae.
7. *Oronoqua deina* Fenn., post-tarsus.
8. *Microissus psychoda* Fenn., vertex, pronotum and mesonotum.
9. *Microissus psychoda* Fenn., head, front view.
10. *Microissus psychoda* Fenn., profile.
11. *Microissus psychoda* Fenn., tegmen.
12. *Microissus psychoda* Fenn., wing.
13. *Microissus psychoda* Fenn., lateral view of pygofer.
14. *Microissus psychoda* Fenn., process of aedeagus.
15. *Microissus psychoda* Fenn., anal segment.
16. *Microissus psychoda* Fenn., right genital style.
17. *Microissus psychoda* Fenn., aedeagus.
18. *Microissus psychoda* Fenn., anal segment, lateral view.

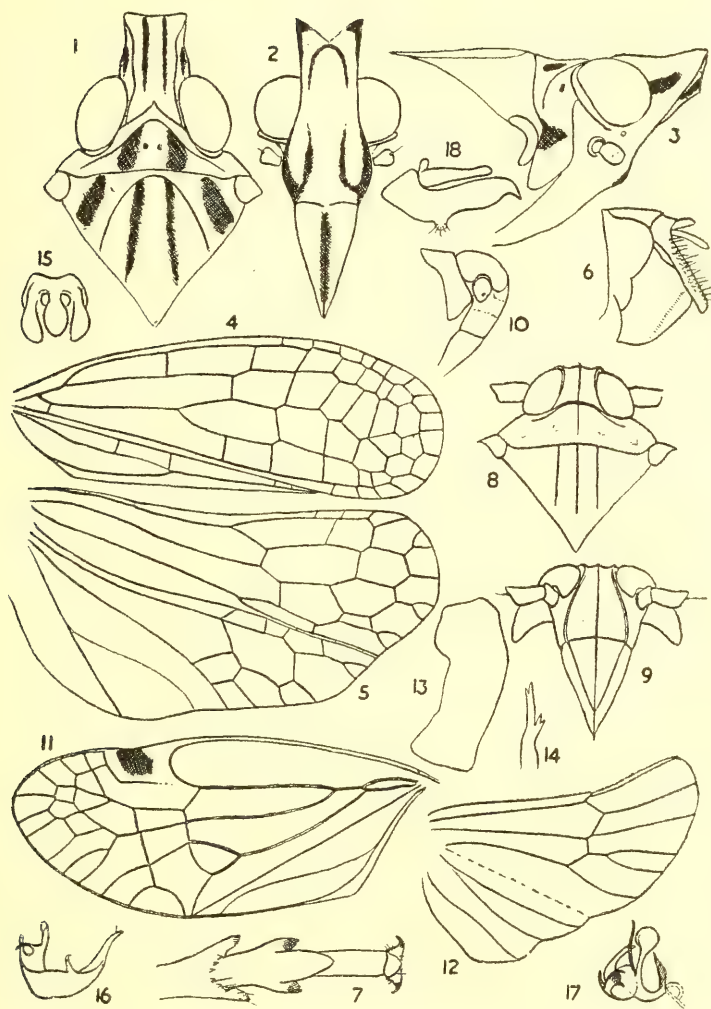


Plate V
New Fulgoroidea

Tegmina about 2.3 times as long as broad, coriaceous except on membrane, anterior margin slightly convex, indented at node, apex strongly rounded, posterior portion of apical margin oblique; Sc + R + M forking near base, Cu 1 forking a three quarters length of clavus, basad of Sc + R fork, 12-13 areoles on apical margin, two rows of subapical areoles except in M and Cu. Wings with Sc, R and M simple, Cu 1a two-branched, Cu 1b simple.

Anal segment of male subquadrate in dorsal view, lateral lobes slightly produced; genital styles (harpagones) asymmetrical. Genotype, *Microissus psychoda* new species.

***Microissus psychoda* new species.**

Male. Length, 1.5 mm.; tegmen 1.5 mm.

Fuscous-piceous; a bar across frontoclypeal suture, three bars transversely on each side of median carina of frons, carinae of frons, vertex, pronotum, apical margin of tegulae, two bars on each gena, two spots in each laterodorsal portion of pronotum, margins of ventrolateral pronotal lobes, apices of femora and of tibiae, four spots across middle of mesonotum yellowish-testaceous.

Tegmina hyaline; veins and a large spot in middle of every cell of membrane, a sprinkling in distal half of cells of corium, cells of clavus dark brown; a pale line across veins marking nodal line. Wings hyaline, veins fuscous.

Aedeagus with a strongly pigmented dorsal spine, below this a vertical plate; below this again on one side a long curved spine and a small two-clawed appendage at its base; on the other side a small spine and a longer curved spine.

Left genital style with a single vertical spine and inside it at base a vertical lobe and a curved spine arising from it one-third from its base; right genital style with a small curved spine directed posteriorly, a large subvertical plate unequally forked distally.

Described from 3 males collected on La Gonave Island, (Haiti) by J. G. Myers (22.7.1931). BM 1931—448. Type in B.M.N.H.

This genus belongs in the subfamily Prosotropinae. The structure of the tegmina, the venation and the asymmetrical genital styles are, on present knowledge, unique in the family.

PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW OWLS FROM BOLIVIA

BY W. E. CLYDE TODD

A recent study of the Owls in the collection of the Carnegie Museum indicates the existence of two apparently undescribed races of certain species belonging to the genera *Pulsatrix* and *Ciccaba*. These new forms are characterized and named herewith. All are from Bolivia. In identifying them I have had the benefit of advice from Mr. James L. Peters, to whom I am indebted for many such courtesies. For the loan of critical material for comparison my thanks are due to the authorities of the American Museum of Natural History and of the U. S. National Museum.

***Pulsatrix melanota philoscia*, subsp. nov.**

Type (and only specimen), No. 86,206, Collection Carnegie Museum, adult female; San José, Yungas de Cochabamba, Bolivia, May 29, 1921; José Steinbach.

Subspecific characters.—Similar to *Pulsatrix melanota melanota* (von Tschudi) of Peru, but larger; above slightly paler; lores and superciliaries almost entirely white (not rusty); underwing lining whiter, less buffy; tarsi deeper buffy; tail relatively shorter. Wing, 305; tail, 163; bill from cere, 22; tarsus, 51.

Range.—Known only from the type-locality, but probably ranging throughout the highlands of Bolivia.

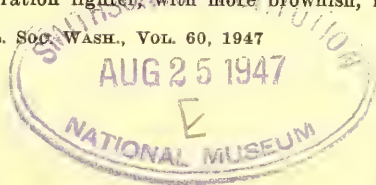
Remarks.—Mr. Peters writes: "Your bird is *Pulsatrix melanota*. I have compared it with two specimens, male and female, that I borrowed from the American Museum of Natural History, and I note the following differences. Your bird is larger (wing 305 as against 260-275); * * * [quoted above]. These differences to my mind are sufficiently marked to warrant describing this bird as a new subspecies."

According to the description this cannot be the *Pulsatrix perspicillata pinto*i of Kelso (Biological Leaflet No. 11, 1939, 1). In a later paper (*ibid.*, No. 33, 1946, pl.) he figures a Bolivian specimen in the British Museum (Natural History), and comments on the variation shown.

***Ciccaba albitarsus tertia*, subsp. nov.**

Type, No. 85,070, Collection Carnegie Museum, adult male; Ineachaca, Bolivia, August —, 1920; José Steinbach.

Subspecific characters.—Similar to *Ciccaba albitarsus opaca* Peters of Peru, but general coloration lighter, with more brownish, less blackish.



Similar also to *C. albitarsus albitarsus* (Bonaparte) of Colombia and Venezuela, but with more buffy color above, and the brown color reduced in extent; the "face" is also lighter in color (more buffy, less brownish). "Iris pale slate-color; feet yellow" (Steinbach).

Range.—Presumably the Temperate Zone of the Andes of Bolivia.

Remarks.—These birds have been compared with the type-series of *Ciccaba albitarsus opaca* Peters, whose describer indorses their subspecific distinctness. They have also been compared with a small series from Colombia and Venezuela. Everywhere the species appears to be rare.

PROCEEDINGS
OF
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RACE OF THE INTERMEDIATE EGRET,
EGRETTA INTERMEDIA (WAGLER)

BY H. G. DEIGNAN¹

The form of intermediate egret resident in the Indo-Chinese countries has until now been considered identical with *E. i. intermedia* of Java. My recent studies have shown that it is distinct, and since no name seems to be available for it, I propose that it be called

Egretta intermedia palleuca, subsp. nov.

Type.—U. S. National Museum No. 336202, adult male in full nuptial plumage, collected at Muang Chiang Rai (lat. 19°55' N., long. 99°50' E.), Chiang Rai Province, northern Siam, on January 27, 1937, by H. G. Deignan (original number 2205).

Diagnosis.—Like true *E. i. intermedia* in having the bare portion of the tibiotarsus black, but agreeing with *E. i. brachyrhyncha* (Africa) and *E. i. plumifera* (Australia) in having the bill at all seasons yellow, with the maxilla tipped horny brown.

Range.—Eastern Bengal; Assam; Burma, Siam; Indochine; south-eastern Yunnan; formerly throughout eastern and central China north to the Yangtze.

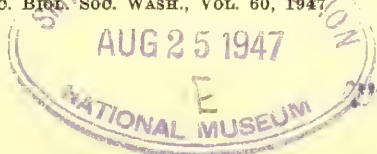
Remarks.—According to Kuroda (Birds of Java, vol. 2, 1936, p. 547), the colors of the soft parts in topotypical *intermedia* are as follows: "Bill yellow tipped with blackish brown (non-breeding bird); bill of breeding ♂ black, of ♀ black washed with yellowish, and yellow at base of bill and bare face of both sexes; exposed tibia, tarsi and toes always black (examined by KURODA)."

All specimens in nuptial dress known from Siam have the bill as described in my diagnosis. That the same is true in other parts of the Indo-Chinese Subregion may be adjudged from the following references:

"What few adults (with dorsal trains) I have seen had the bill wholly yellow, with one exception only, wherein the terminal two-thirds are black" (Blyth, Ann. Mag. Nat. Hist., vol. 14, 1844, p. 118, on birds from the neighborhood of Calcutta).

"Cette aigrette, dont la taille (0^m, 70) est intermédiaire entre celle de l'*Herodias alba* et de l'*Herodias garzetta*, se distingue également de ces deux espèces par la couleur de son bec qui est jaune en toute saison, avec la pointe marquée de noir . . ." (David and Oustalet, Oiseaux de la Chine, 1877, p. 440).

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"In winter there are no plumes and the bill is yellow pointed with black. Most birds in spring appear to have the bill yellow with the black tip. Probably the bill turns black only just when the birds begin to nest" (La Touche, Handbook of the Birds of Eastern China, vol. 2, pt. 5, 1934, p. 447).

I suggest that any southeastern Chinese example with the bill black will prove to be representative of the race that breeds in Japan and occasionally appears as a winter visitor in China.

It may be doubted whether the name *intermedia* is really applicable to birds from Japan, India, and Ceylon. In regard to those of the last-named place, it is noteworthy that Legge (Birds of Ceylon, 1880, p. 1141) speaks of the tibiae as yellowish brown in the breeding season. Lack of Javanese material makes it impossible for me to discuss these populations.

No old name seems to be employable for the Indo-Chinese race. *Ardea putea*, used for Calcutta birds by Blyth (Ann. Mag. Hist., vol. 12, 1843, p. 167; *tom. cit.*, vol. 14, 1844, p. 118), might be used, had it not made its first appearance as a *nomen nudum* in synonymy with *Ardea alba* Linnaeus (Franklin, Proc. Comm. Sci. Corr. Zool. Soc. London, pt. 1, 1831, p. 124).

It might be well to mention in passing that the specimen of "*Herodias intermedia*" reported from Madagascar by Richmond (Proc. U. S. Nat. Mus., vol. 19, 1897, p. 680) has been examined and found to be an example of *Egretta alba melanorhynchos* (Wagler).

PROCEEDINGS

OF

BIOLOGICAL SOCIETY OF WASHINGTON

NEW BIRDS FROM PERNAMBUCO, BRAZIL

By JOHN T. ZIMMER

I have recently had the pleasure of examining several interesting birds collected in Recife, Pernambuco, for the U. S. National Museum by Mr. Donald Lamm. Two of the forms proved to be new and a third equally interesting since it has not recently been recognized. Through the kindness of Dr. Herbert Friedmann of the National Museum I am able to present the descriptions of the new birds and a discussion of the form which is revived.

I am further grateful to Mr. Emmet R. Blake and Mrs. Ellen T. Smith of the Chicago Natural History Museum for the loan of the type of the exhumed form without which its validity could not have been determined.

Since the greater part of the comparative material examined is in the American Museum of Natural History, I have indicated only those specimens that are in other institutions. Names of colors are capitalized when direct comparison has been made with Ridgway's 'Color Standards and Color Nomenclature.'

Picumnus exilis pernambucensis, new subspecies

Type.—from Recife, Pernambuco, Brazil. No. 377212, U. S. National Museum. Adult male collected August 20, 1944, [by Donald Lamm].

Diagnosis.—Nearest to *P. e. exilis* of Bahia, Brazil, but easily distinguishable by darker and more uniformly colored back, with the yellowish tips and the dark subterminal bars or spots nearly obsolete, the sharp pattern on the upper wing-coverts similarly reduced and inconspicuous, and the dark bars on the under surface of the body prominent but finer than in *exilis*.

Range.—Known only from the type locality.

Description of type.—Mantle Saccardo's Olive in general effect, having the tips of the feathers dull Old Gold and a subterminal bar or spot (sometimes also a second smaller spot basad of this) Brownish Olive, with the pattern only weakly contrasted; rump clearer, Buffy Citrine; upper tail-coverts yellowish white, with suggestions of one or two dusky marginal dots on each web. Top of head black with tips of the broad forehead and anterior part of crown near Flame Scarlet; back of head with small, round subterminal white dots; hind neck olive with similar white dots. Prominent bushy nasal tufts buff with some fine black hair-like tips; lores and small superciliary stripe white; circumocular and

postocular space denuded, blackish; malar region whitish; auriculars largely dull brownish olive crossed by darker bars; chin and throat whitish, passing gradually into Deep Colonial Buff on lower belly and flanks, and evenly barred throughout with fine blackish lines, two on each feather from the breast posteriad and with suggestions of a third bar on the distal feathers. Wings brownish black; secondaries and tertiaries margined with Old Gold; outer margins of primaries inconspicuously pale; upper wing-coverts dull Buff Citrine with narrow dusky terminal margins, a poorly defined subterminal dot of dull yellow, and a slight dusky shaft-streak immediately basad—the pattern inconspicuous; under wing-coverts largely dull whitish but under primary-coverts blackish; inner margins of remiges inconspicuously pale. Tail mostly black; (median rectrices missing), second pair unmarked; third with a buffy brown blotch at tip of outer web and part way basad along outer margin; remaining feathers with a dull whitish band crossing from middle of outer web diagonally to tip of inner web. Bill (in dried skin) black distally, slaty basally; feet blackish. Wing, 50 mm.; tail, 26; exposed culmen, 10.5; culmen from base, 12.8; tarsus, 13.

Remarks.—Although there is only one example of this piculet at hand, it is so distinct from any other form with which I am acquainted that its validity as a new form seems unquestioned. Its affinities appear to be definitely with *exilis* whose pattern is present in detail although so subdued that at first glance the similarity is not obvious. The barring on the under side is equally complete in some examples of *exilis* but much coarser—with the dark and light portions nearly or quite of the same width, whereas in *pernambucensis* the dark bars are only about half the width of the pale ones, or even less. The strong, bushy nasal tufts also resemble those of *exilis*. I have not seen *P. e. alegriae* from Maranhão, but the description of the dorsal surface as marked with numerous, very distinct yellowish white and blackish spots and orange spots on the anterior crown suggests little resemblance to the Pernambuco bird.

As far as I can determine, this is the first piculet to be discovered in Pernambuco.

Specimens Examined

P. e. exilis.—

Brazil:

Bahia, Cajazeiras, 1 [♀];

“Bahia” (trade-skins, 5 ♂, 1 ♀, 4 ♂¹).

P. e. pernambucensis.—

Brazil:

Pernambuco, Recife, 1 ♂ (type)¹.

Automolus leucophthalmus lammi, new subspecies

Type from Recife, Pernambuco, Brazil. No. 383292, U. S. National Museum. Adult male collected August 12, 1945, [by Donald Lamm].

Diagnosis.—Nearest to *A. l. leucophthalmus* of the coast district of central Bahia, but upper parts darker and browner, less brightly rufescent; throat more strongly tinged with pale yellow and more sharply defined from the breast which in turn is more creamy olive buff, less pinkish buff; sides of breast browner, less rufescent; flanks and under

¹Specimens in U. S. National Museum.

tail-coverts less tawny; bill darker, with the dark shade invading the commissural margin of the mandible. Differences from the lighter *A. l. sulphurascens* of southern Bahia to Paraguay, are of the same nature but even more pronounced, and the size is greater.

Range.—Known only from eastern Pernambuco, Brazil.

Description of type.—Top of head near Prout's Brown, paler on the forehead and with pale shaft-streaks, conspicuous only on the front; mantle Cinnamon-Brown with a trace of Dresden Brown; rump and upper tail-coverts a little brighter than Russet. Lores whitish; auriculars dark brown, somewhat blackish toward the base, and with paler shaft-streaks; chin and throat Marguerite Yellow; breast and middle of belly somewhat more isabelline than Deep Olive Buff, rather abruptly defined from the throat; sides of breast dark Dresden Brown; flanks approaching Cinnamon-Brown; under tail-coverts Dresden Brown \times Buckthorn Brown. Remiges blackish, with outer webs of primaries and secondaries and most of the inner webs also of the tertials Prout's Brown; exposed portions of upper wing-coverts Prout's Brown; bend of wing ochraceous; under wing-coverts tawny Buckthorn Brown; axillars duller; inner margins of remiges extensively cinnamomeous. Tail about the color of the rump. Bill (in dried skin) with maxilla and commissural margin of mandible dull blackish; remainder of mandible dull yellowish. Wing, 95 mm.; tail, 84; exposed culmen, 20; culmen from base, 25.7; tarsus, 23.

Remarks.—A female from the type locality matches the type in essential details and differs only in slightly smaller size. Wing, 88.3 mm.; tail, 79; exposed culmen, 19; culmen from base, 22.6; tarsus, 23.

The more extensively shaded and darker bill of this form may possibly indicate a trend toward *Automolus infuscatus*, one form of which, *paraensis*, occurs in the Pará district of eastern Brazil. The darker and duller hues of the general coloration may possibly point in the same direction, but there is still too great distinction between the two groups to justify specific union.

I take pleasure in naming this new form for Mr. Donald Lamm who collected the type and paratype and who has secured other interesting birds in Recife during his residence in this still imperfectly known section of Brazil.

A change of names will be noted in the preceding paragraphs. It is necessitated by a study of recently collected material from southern Bahia in comparison with the cotypes of Wied's "*Anabates leucophthalmus*." These cotypes are too faded to be of much service in determining the allocation of the name *leucophthalmus* on the basis of color. The male cotype is larger than any of thirteen males from more southern localities, having the wing 95 mm. in length; the female cotype, with the wing 86, agrees with the average of the southern females (82-89) although larger than most and smaller than any specimen of "*bangsi*" of which, however, I have no authentic females.

A weighty factor lies in three birds (two males and one non-sexed example) from Cajazeiras, Rio Grungogy, Bahia, which are relatively fresh (1928), large (wing, 93, 95.5, 97 mm.), and dark-tailed in comparison with twenty-four examples of both sexes from Minas Gerais and southern Goyaz, southward. The Rio Grungogy is the next principal stream north of the Rio do Cachoeira, the type locality of *leucophthal-*

mus, and there is no distributional barrier in evidence in the few miles of terrain that separate the two areas. There is no question that the Cajazeiras specimens belong to the large, dark-tailed north-Bahian form and the cotypes of *leucophthalmus* assuredly must belong to the same population, to which Wied's name is to be transferred. The oldest name for the southern population appears to be *sulphurascens* (*Sphenura sulphurascens* Lichtenstein, Verz. *Dubl. Berliner Mus.*: 41, 1823—São Paulo).

It is apparent that Cory, in describing "*bangsi*," was misled by the faded condition of one of the cotypes of *leucophthalmus* into associating it with the pale-tailed southern form.

Specimens Examined

A. l. sulphurascens.—

Brazil:

- Goyaz (Goyaz and Fazenda Esperança), 1 ♂, 1 ♀;
 Minas Gerais (Resplendor, São Benedito, and São Francisco), 1 ♂, 2 (?);
 Espírito Santo (Sagrado do Veador and Baixo Guandú), 2 ♂;
 São Paulo (Piquete, Fazenda Cayoá, São Sebastião, and Ubatuba), 4 ♂, 1 ♀;
 Paraná (Guayra), 1 ♂, 2 ♀;
 Santa Catharina (Salto Pirahy and Palmital), 2 ♂, 2 ♀.

Paraguay:

- (Upper Igassú River, Colonia Independencia, and east of Caaguassú), 3 ♂, 2 ♀.

A. l. leucophthalmus.—

Brazili:

- Bahia, [Rio do Cachoeira], 1 ♂, 1 ♀ (cotypes);
 Cajazeiras, 2 ♂, 1 (?);
 "Bahia" (trade-skins), 11 (?).

A. l. lammi.—

Brazil:

- Pernambuco, Recife, 1 ♂ (type)¹, 1 ♀¹.

Lepidocolaptes fuscus atlanticus (Cory)

Picolaptes fuscus atlanticus Cory, *Field Mus. Nat. Hist., Orn. Ser.*, 1: 341, Aug. 30, 1916—Serra Baturité, Ceará, Brazil; ♂; Chicago Nat. Hist. Mus.

Two specimens of the present species from Recife, one collected by Donald Lamm; the other, by Lieut. E. W. Pfeiffer, I at first believed to represent an undescribed form, but I am now convinced that they must be referred to *atlanticus* whose validity they amply establish. Through the kindness of Mr. Emmet R. Blake and Mrs. Ellen T. Smith of the Chicago Natural History Museum I have been able to examine the type of Cory's form which proves to be not fully adult and probably in the first "winter" plumage. It shows certain distinctions from the two adult Recife birds which might have marred the belief in their sub-

¹Specimens in U. S. National Museum.

specific identity were it not for two similarly immature examples from Palmares, Pernambuco, in the Kaempfer Collection of the American Museum which undoubtedly belong to the same form as the Recife examples and which show the same sort of distinction as the Ceará type.

Briefly, *atlanticus* may be recognized by the richer ochraceous color of the pale portions of the under parts, in comparison with all the other forms now recognized, being most nearly approached by *tenuirostris* in that respect, although *tenuirostris* has the pale ventral stripes narrower as well as lighter and margined with a darker brown, usually with a fine submarginal line of blackish. The stripes approach those of *fuscus* in breadth but are decidedly deeper in color, and the maculate pattern is carried up to the foreneck, with the gular feathers also narrowly margined or at least tipped with darker color, more pronouncedly than in most *tenuirostris*; the throat of *fuscus* is more nearly immaculate. Furthermore, the greater and median upper wing-coverts (or most of them) have a blackish subterminal shaft-streak, sometimes slightly expanded distally (most pronounced in the type) which does not appear to be developed so clearly in any of the others forms, although it is slightly suggested in one or two examples of *tenuirostris*. The north-Bahian form, *brevirostris*, which is geographically nearest to *atlanticus*, is a much paler bird, being lighter even than *fuscus* and with the pale dorsal streaks more whitish and less buffy or ochraceous than in the other forms; its bill is short (26-28 mm. in the skins examined).

Young birds (in first "winter" plumage) have the ventral maculations even less clearly defined than the adults but agree in the strong ochraceous tone of general coloration in that region, as in the presence of the dark markings on the upper wing-coverts. The type is lighter in color below than the Pernambuco birds but agrees with them in so many other particulars in distinction from the other forms that association is indicated. The type has a shorter bill than the others (culmen from base, 28.5 mm. as against 30-32), but the distinction is within the bounds of individual variation exhibited by other subspecies of the group. The average size of bill is greater than that of any other form, judging by the specimens at hand, which may be an additional character for *atlanticus*, however undemonstrable by the type.

A study of the available series of the different forms leads to the belief that *tenuirostris* occurs in the state of Espírito Santo north of the Rio Doce. Five males and three females from Lagoa Juparaná are better matched in the series of that form than with the more southern *fuscus* which occurs south of that stream both in Espírito Santo and in Minas Gerais. A single bird from the north bank of the Rio Doce opposite Resplendor, Minas Gerais, also agrees best with *fuscus* to which I refer it pending a larger series from this inland portion of the river.

Specimens Examined

L. f. atlanticus.—

Brazil:

Ceará, Serra Baturité, 1 ♂ (type)¹;

Pernambuco, Recife, 1 ♂², 1 (♀)²;

Palmares, 2 ♂.

¹Specimen in Chicago Natural History Museum.

²Specimens in U. S. National Museum.

L. f. brevirostris.—

Brazil:

Bahia, Villa Nova, 1 ♀;
Sincorá, 2 ♂.

L. f. tenuirostris.—

Brazil:

Bahia, Cajazeiras, 2 ♂, 1 ♀, 1 (?);
Baixão, 1 ♀;
"Bahia" (trade-skins), 4 (?);
Espírito Santo, Lagôa, Juparaná, 5 ♂, 3 ♀.

L. f. fuscus.—

Brazil:

Espírito Santo, Baixo Guandú, 1 ♂;
Sagrado do Veado, 1 ♂;
Engenheiro Reeve, 1 ♂;
Minas Gerais, Rio Jordão, 1 ♂;
São Benedito, 1 ♀;
Fazendinha Emerick, 1 ♀;
Rio Doce, [opposite] Resplendor, 1 ♂;
Rio de Janeiro, Therezopolis, 1 ♂, 3 ♀;
Ponte Maromba, 1 ♂;
Monte Serrat, 1 ♂;
La Raiz, 1 ♂;
São Paulo, Itapura, 1 ♂;
São Sebastião, 1 ♂, 2 ♀;
Victoria, 2 ♂;
Paraná Tibagy, 1 ♀;
Corvo, 1 ♂, 1 (?);
Guayra, 1 ♂;
Roça Nova, 1 ♂;
Santa Catharina, Salto Pirahy, 4 ♂, 1 ♀;
Ilha Redonda, 1 ♂, 1 (?).

Argentina:

Misiones, Piray, 1 ♂.

Paraguay:

upper Yguazú, 1 (?).

PROCEEDINGS
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NOTES ON WEST INDIAN FLATIDAE (HOMOPTERA:
FULGOROIDEA)

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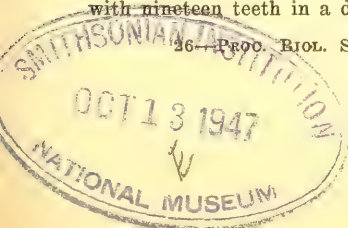
The following notes are intended to supplement those published five years ago (*Proc. Ent. Soc. Wash.* 1942, 44: 155-167), and refer to nephesine and selizine genera from the Antilles. Two new genera are established to receive new species, while six others are proposed for known species which are anomalous in the genera to which they are currently assigned. Further new species are added to the genera *Antillormenis*, *Ilesia* and *Euhyloptera*. The types, except where otherwise stated, are in the U. S. National Museum.

PSENOFLATA gen. nov.

Frons broader than long (1.3:1), median carina distinct on basal two thirds, absent from apical third, lateral carinae indicated at base, lateral margins carinate; no carinae on clypeus; vertex short, width of head with eyes equal to width of thorax. Pronotum smooth, a shallow depression on each side anteriorly; mesonotum with median carina feebly indicated at base and apex, lateral carinae at base. Post tibiae with two spines. Tegmina expanding distally, costal and sutural margins slightly diverging, only very slightly curved, apical margin straight, abruptly truncate, apical angle about 80 degrees, sutural angle 90 degrees, very abrupt; apical line uneven but usually discernible, one or two rows of small irregular cells between apical line and the short, more even cells adjoining apical margin, nodal line absent or obscure; Sc simple to apex, R forking between a quarter and two fifths from base, M forking slightly basad of R fork, Cu forking level with or slightly basad of M fork. Wings with Sc and R simple to apex. Post-tibiae with two spines.

Anal segment of male deflexed distally through 75 degrees, deflexed apical part nearly twice as long as horizontal basal part; arising from ventral middle line below anal style and deepening anteriorly a vertical plate terminated by a transparent flat lobe directed posteriorly. Genital styles with an eminence on dorsal border near apex, posterior to this a slight excavation; apical process a rather thin spine, curved backward, upward and slightly forward.

Anal segment of female short, bluntly rounded, with a distinct notch at apex. Ovipositor with third valvulae broad and stout, armed distally with nineteen teeth in a double row; first valvulae with very broad flat-



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topped teeth on lower margin and four very small pointed teeth on upper margin. Egg narrowly oval, in profile slightly more pointed at one pole; a long narrow operculum towards one pole.

Genotype, *Ormenis brevis* Van Duzee, 1907 *Bull. Buff. Soc. Nat. Sci.* 8, 5:38.

The writer has seen the types of *Ormenis albipennis* Van Duzee and its variety *brevis*, which is regarded as a good species separated by size, and by the shape of the sutural angle, medioventral process of the anal segment and periandrial spines. *O. jamaicensis* Fenn. (*Proc. Ent. Soc. Wash.* 1942, 44:162) is the same as *O. brevis* Van Duzee, and becomes a synonym.

FLATIRIS gen. nov.

Frons slightly broader than long (1.1 or 1.2:1), median carina distinct on basal two thirds, absent from apical third, lateral carinae absent or obsolete on basal third, lateral margins carinate; clypeus without carinae; vertex very short; width of head with eyes subequal to width of thorax. Pronotum with a slight depression anteriorly on each side of middle line; mesonotum without carinae or lateral carinae indicated only at base. Post-tibiae with one or two spines before apex. Tegmina scarcely widened distally, costal margin very slightly convex, apical margin rounded-truncate, apical angle about 82 degrees, sutural angle about 98 degrees, both rounded, sutural margin straight; Sc strong, simple to apex, R forking slightly more than one-quarter from base, M forking basad of R fork, Cu forking level with or slightly basad of M fork. Apical line fairly even and distinct, nodal line parallel to apical margin, marked by irregular cross-veins and a slight depression from middle of apical quarter of tegmen to near apex of clavus. Wings with Sc simple at apex, R simple, M forked once.

Anal segment of male devoid of median ventral process; deflexed part of segment subequal to horizontal part. Genital styles expanding in width distally, apical process a long curved spine curved anteriorly.

Anal segment of female bluntly rounded. Ovipositor with third valvulae stout, armed on apical margin with 17 to 20 teeth in two rows, with an additional two teeth on an eminence on inner face of each valvula.

Genotype, *Ormenis plumbea* Fenn., 1941, *Proc. Ent. Soc. Wash.* 43:198.

O. silvestris Fenn. also belong to this genus, which is known only from St. Lucia and Dominica, B. W. I. Its members are distinguished by the frontal proportions, the shape and venation of the tegmina, as well as by the general characters of the male and female genitalia. The difference in the number of post-tibial spines between the two species does not justify the recognition of two sub-genera in view of the agreement of the remaining characters.

RICULIFLATA gen. nov.

Frons broader than long (nearly 1.2:1), median carina present on basal two thirds, absent from apical third, lateral carinae absent, margins symmetrically arcuate about a line transversely through middle of frons. Post-tibiae bispinose. Tegmina very slightly expanded distally, 2.1 times as long as wide, costal area at level of humeral callosity equal to costal cell, distally rather broader; apical margin rounded-truncate,

apical angle about 75 degrees, broadly rounded, sutural angle about 105 degrees, rounded, not prominent; apical line distinct and fairly even, nodal line obscure, the majority of apical veins not forked; Sc simple, R forking at basal third, M forking slightly basad of R fork, Cu₁ forking slightly basad of M fork. Wings with Sc simple, R simple to apex.

Anal segment of male devoid of median ventral process, smoothly curved downward in distal half through about 30 degrees. Genital styles with dorsal and ventral margins subparallel, apical margin strongly convex, almost semicircular, apical process rather broad, laminate, twisted inward in distal half.

Anal segment of female slightly longer than third valvulae, rather narrow. Ovipositor with third valvulae stout, somewhat elongated and tapering distally, each armed with four teeth on distal margin; first valvulae exceptionally long, pointed at apex, with three teeth both on lower and upper margins near apex. Pregenital sternite with a distinct knob like eminence in middle of posterior margin.

Genotype, *Pocilloptera perpusilla* Walker, 1851 List Hom. II:467, 61.

The genus is known at present only from Jamaica, B. W. I., and is distinguished by the characters of the frons, tegmina and genitalia.

ANTHOFLATA gen. nov.

Frons broader than long (1:3, 1), median carina distinct on basal two-thirds, absent or only indicated on apical third, lateral carinae absent, lateral margins carinate; clypeus devoid of carinae; vertex very short; head with eyes as wide as pronotum. Pronotum with an impression anteriorly on each side of middle line; mesonotum with median carina present feebly at base and indicated at apex, lateral carinae slightly indicated at base. Post-tibiae bispinose. Tegmina expanding distally, costal margin very slightly convex, apical margin rounded-truncate, sutural margin slightly concave, apical angle rounded, about 65 degrees, sutural angle rounded, about 87 degrees, costal area generally wider than costal cell, though subequal to it one quarter from base, not much expanding distally; nodal and apical lines even and distinct, both joining costa anteriorly, apical line parallel to apical margin, nodal line slightly concave basad near its middle, apical areoles subequal to subapical areoles, longer than veins of costal area, a few veins distad of apical line forked, some of the subapical veins with an ovate callus; Sc simple to apex, R forking just basad of middle of tegmen, M forking basad of R fork, about two fifths from base, Cu forking slightly basad of M fork, or at same level. Wings with Sc and R simple, M forked once, Cu₁ with five branches.

Anal segment of male short, thin, apical margin bluntly rounded, only slightly deflexed distally, devoid of a median ventral process. Genital styles slightly expanding distally, apical process a long spine curved anteriorly towards apex.

Anal segment of female short, bluntly rounded. Ovipositor with third valvulae broad and stout, armed distally with about 17 curved teeth, rather long, in two rows; a patch of setae on inner face of each valvula; first valvulae with three rectangular notches near apex on ventral margin, apex pointed, two minute teeth on upper margin.

Egg rectangular-ovate, tapering towards one pole, heavily beset with

minute spinose-papillose chorionic processes at narrower pole and on one side near it.

Epidermal secretion of nymphs reddish-brown.

Genotype, *Ormenis fortunata* Fennah, 1941, *Proc. Ent. Soc. Wash.*, 43:198.

Anthoflata ingae n. sp.

Male. Length, 6.8 mm.; tegmen, 6.6 mm. Female. Length, 6.6 mm.; tegmen, 7.8 mm.

Ochraceous clouded fuscous; basal part of front, pronotum, fore and middle legs, post tibiae and tarsi and abdominal sclerites rather more infusate; mesonotum brown, fuscous laterad of discal margins; tegmina dull brown, corium mainly semi-transparent in basal two thirds, a large clear round transparent spot in M just basad of nodal line, corium between this spot and apical third of clavus fuscous; costal area, membrane and clavus fuscous, a round piceous spot in middle of clavus; veins concolorous, Sc, R and M at base narrowly lined fuscous. Insect in life powdered light brown.

Aedeagus tubular, slightly curved upward distally, apex in profile very obliquely subtruncate, a pair of long spines arising at apex, directed forward ventrally, the spine on left exceeding three-quarters length of aedeagus, slightly incurved, the spine on right shorter and more strongly incurved, posterior ventral margin of periandrium sinuately tapering to a point.

Ovipositor with second valvulae in profile with ventral margin straight, dorsal margin inflated at base, tapering to apex with a slight transverse ridge or step upward at apical quarter.

Described from 12 males and 10 females taken by the writer at Dudmar (Oct. 20, 1943) and Grand Etang (Oct. 28, 1943), Grenada, B. W. I. on *Inga laurina*. This species differs from *A. fortunata* in the left spine of the aedeagus which is fully twice as long as that in *fortunata*, and in the tegminal pattern, the position of the distal spot being more posterior, and whereas an oval transparent spot is present near the base of the corium in *fortunata* (giving the tegmen a resemblance to a face mask) the corresponding area of the corium in *ingae* is only semi-transparent and not clearly defined.

ALCAXOR gen. nov.

Frons slightly longer than broad, median carina distinct in basal half, absent in apical half, lateral carinae absent, lateral margins carinate, diverging gradually to below level of antennae thence incurved to suture; clypeus devoid of carinae; vertex short, scarcely half as long as pronotum. Pronotum with disc flat, anteriorly convex, a short impressed horizontal ridge behind eyes, posterior margin shallowly rounded; mesonotum not much swollen anteriorly, devoid of carinae, disc almost flat. Post-tibiae with one spine. Abdomen in profile conical. Tegmina 1.8 times as long as broad at widest part, expanding distally, costal margin slightly convex, apical margin rounded truncate, apical angle 80 degrees, rounded, sutural angle 98 degrees, rounded, commissural margin straight or very slightly concave; costal area rather broader than costal cell distad of humeral elevation, Sc simple to apex, R forking at middle of tegmen, M forking in basal quarter, Cu forking slightly basad of M

fork; apical line fairly even and distinct, apical areoles scarcely longer than width of costal area, nodal line represented by a few irregular transverse veins, subapical areoles fewer than apical and twice as long as them, three or four longitudinal veins forked once between nodal and apical lines, no veins forked distad of apical line; few transverse veinlets on corium. Wings with Sc simple to apex, R once forked, lower branch joining first branch of M.

Anal segment of male elongate, narrow, deflexed through 55 degrees distad of anal foramen, apical quarter further deflexed through 60 degrees, expanded laterally and produced in a finger-like lobe on each side near apex. Pygofer with anal angles not produced, posterior margin oblique, slightly convex. Genital styles broad, expanding distally, with a large U-shaped excavation at apex bounded by a pointed eminence on each side.

Genotype, *Alcaxor pallidus* n. sp.

Alcaxor pallidus n. sp.

Male. Length, 5.5 mm.; tegmen, 7.0 mm.

Pallid green; eyes red, tips of post-tibial spines black. Insect in life powdered very pale grey.

Aedeagus tubular, curved upward distally, a pair of short spines dorsally at apex directed anteriorly, on each side ventrally near apex a stout bifurcate spine directed anteriorly, both branches shallowly curved, one half as long as other; on each side at base of the bifurcate spine an oval callus.

Described from one male taken by the writer at 800 ft. in mountain forest near Saltoun, Dominica, B. W. I. (June 18, 1939) on *Miconia* sp.

ANTILLORMENIS Fennah

Fennah, 1942, *Proc. Ent. Soc. Wash.*, 44, 8:157.

Orthotype, *Ormenis contaminata* Uhler, *Proc. Zool. Soc. Lond.* 1895: 71.

Uhler's description was based on a series of insects that included both *A. contaminata* Uhl. and *A. sancti-vincenti* Fenn., as his specimens in the British Museum and U. S. National Museum plainly reveal. The holotype agrees with the redescription of *contaminata* Uhl. given by the writer (*Proc. Ent. Soc. Wash.*, 1942, 43:202).

Antillormenis martinicensis n. sp.

Male. Length, 6.2 mm.; tegmen, 6.5 mm. Female. Length, 6.4 mm.; tegmen, 6.7 mm.

Pale testaceous; disc of clypeus, mesonotum, abdominal tergites and genitalia fuscous. Tegmina tawny, a broad piceous band overlying costa basally, and between Sc and R to apex; veins distad of apical line fuscous, membrane fuscous, base of clavus clouded fuscous. Wings slightly infusate. Insect in life powdered pearly grey or pale fawn.

Anal segment of male with medioventral process almost square, ventral margin straight. Aedeagus with a pair of dorsal spines arising at apex and directed anteriorly for more than half length of aedeagus, ventrally a pair of shorter and stouter spines arising one fifth from apex, curved anteriorly and turned outwards at tip; ventral posterior margin

of periandrium cleft in middle with lateral eminences scarcely pointed.

Medio-ventral notch on posterior margin of pregenital sternite of female twice as broad as deep, the eminence below it roundly convex, not at all angulate.

Described from one male and one female collected by the writer at Fort de-France, Martinique (March 25, 1944) on West Indian lime. This species is close to *A. sanctaliciensis* Fenn., but the dorsal spines of the aedeagus are longer and the ventral spines are slightly longer and not nearly as twisted laterally as in *sanctaliciensis*. The female differs from *sanctaliciensis* in having the notch on the posterior margin of the seventh sternite wider, and the prominent swelling in the middle of the sternite broadly rounded on its posterior margin in ventral view, whereas in the St. Lucian species it is bluntly rectangulate.

It is almost certainly this species which Melichar has illustrated in Pl. 5, fig. 8 of his Monograph, as he quotes Martinique as a locality for Antillean specimens of what he considered *Pocilloptera pallidicosta* Wlk.

ILESIA Fennah

Fennah, 1942, *Proc. Ent. Soc. Wash.*, 44:160.

Orthotype, *Ormenis septempunctata* Fennah, 1941, *Proc. Ent. Soc. Wash.*, 43:196.

Ilesia falcata n. sp.

Male. Length, 4.9 mm.; tegmen, 5.4 mm. Female. Length, 4.6 mm.; tegmen, 5.8 mm.

Testaceous or pale fuscous; mesonotum brown, suffused fuscous, abdominal sclerites pale fuscous. Tegmina fuscous, darker on corium, paler between costal margin and Sc, in apical areoles and along claval suture, a piceous spot at apex of clavus. Wings smoky, veins darker.

Aedeagus tubular, curved upward distally, a short stout curved spine laterally near basal third, a bifurcate spine arising ventrally below apex, one branch slender, subequal to aedeagus in length and curved below it, the other stouter, half as long as the preceding, equally curved but turned outward at tip.

Seventh sternite of female with median notch on posterior margin ventrally nearly twice as broad as deep.

Described from 42 males and 53 females collected by the writer at Cades Bay and Half moon Bay, Antigua, B. W. I. (Aug. 13, Sept. 10, 1943) on *Coccoloba uvifera*, *Caesalpinia bundac*, and *Acacia* sp. This species is distinguished by the shape of the aedeagal spines and of the medio-ventral notch in the pregenital sternite.

EUHYLOPTERA Fennah

Fennah, 1945, *Proc. U. S. Nat. Mus.*, 95:499.

Orthotype, *Euhyopectera corticalis* Fenn., loc. cit.: 500.

Euhyopectera antillana n. sp.

Male. Length, 4.2 mm.; tegmen, 5.0 mm. Female. Length, 4.3 mm.; tegmen, 5.2 mm.

Frons as broad as long. Tegmina 2.3 times as long as wide in widest part, wider in basal half than in distal half, costal margin convex to

node, thence straight, apical margin slightly oblique and slightly convex, apical angle about 80 degrees, rounded, sutural angle about 100 degrees, rounded, commissural margin very slightly concave distad of apex of clavus.

Testaceous; vertex, pronotum, mesonotum, pleurites, abdominal sclerites and genitalia fuscous, membrane of abdomen pallid. Tegmina yellowish brown, basal part of costal area, Sc, forks of R, M, and Cu lined fuscous, membrane fuscous, veins paler. Wings slightly infusate, veins darker. Insect in life powdered pale brown or mottled.

Anal segment of male long, narrow, deflexed distally, with a notch on apical margin extending half way to anal foramen. Pygofer with anal angles prominent in form of a semicircular lobe. Aedeagus tubular, curved upward distally, a pair of stout spines on upper margin at base directed caudad, and from the base of these on each side a sclerotised ridge curving ventrolaterally to near apex; apical lobes of aedeagus horizontal, paddle shaped in ventral view, with a minute tooth externally at base; a long spinose process on each side arising near apex and curved obliquely ventrally then somewhat angularly forward, at which point a very long slender filament is given off posteriorly and lies along ventral surface of aedeagus to apex. Genital styles with apical process in form of a curved sickle shaped spine, distally rounded, with a minute tooth directed ventrad at base distally, the whole process lying adpressed to apex to form a groove or cleft.

Anal segment of female more than half as long as abdomen. Third valvulae of ovipositor oval in profile, one quarter length of anal segment.

Egg bluntly oval, smooth, somewhat flattened on one side; 0.75 mm. long, 0.3 mm. wide.

Described from 12 males and 23 females taken by the writer near Bacolet, Grenada, B. W. I. (Nov. 12-14, 1943) on low bushes near forest. The writer recognizes two subspecies, *grenadana* and *dentata*. The former is the typical subspecies and is recognizable in having an irregular linear spot parallel to the commissural margin in the middle of the clavus, and the apical process of the genital styles with the basal tooth extremely small or evanescent; *dentata*, which is represented in the writer's collection by 19 males and 28 females collected at Petit Bordel, St. Vincent, B. W. I. (Aug. 19-25, 1941) on *Cordia* sp. and low bushes, is distinguished by having a subrectangular spot parallel to the commissural margin in the middle of the clavus, while the apical process of the genital styles bears a stout and prominent tooth at its base on the distal side. *Euhyoletta antillana* differs from *corticalis* Fenn. in having the costal margin less convex in the basal half of the tegmen, the apical and sutural angles broadly rounded, not abruptly angulate, and the apical margin of the tegmina convex, not truncate; in the genital styles the apical process is narrower distally than in *corticalis* where the spine is so prominent as almost to form a flange; in the aedeagus the pair of stout basal spines is absent in *corticalis*, which, however, has a minute median spine dorsally at the base set on a slight membranous eminence and apically a pair of short dorsal spines which are absent in *antillana*; the caudad filament is twice as long in *antillana* as in *corticalis*.

This genus is of exceptional interest in occurring both in the mainland fauna of Trinidad and the very different island fauna of the Windward Islands. The fullest advantage has been taken of the writer's long series

to determine that the differences enumerated above are constant, and there is no room for doubt that the Windward Island insects are specifically distinct from the Trinidad species, and have split into warrantable subspecies. This is the only Flatine genus common to South America and to the Lesser Antilles, and its invasion of the islands would not appear to have been of very recent occurrence.

ORMENINA gen. nov.

Frons slightly longer than broad, median carina present in basal two thirds, lateral carinae indicated basally, lateral margins carinate; vertex short. Pronotum anteriorly convex, posteriorly concave; mesonotum with median and lateral carinae feebly indicated. Tegmina 2.3 times as long as broad, widening to apex; costal margin moderately convex, apical margin truncate or very slightly concave, sutural margin concave, apical angle 75 degrees abruptly rounded at tip, sutural angle 60 degrees, abruptly rounded; costal area as wide as costal cell, Sc simple to apex, R and Cu forked at about same level, M slightly more distally, nodal line distinct, subapical areoles twice as long as apical, veins mostly forked distad of cross veins. Post-tibiae unispinose.

Anal segment of male long, narrow, deflexed close to apex, apical margin distinctly notched, a small ventrally-directed process laterally on each side at about level of anus. Pygofer with lateral angles not prominent. Genital styles expanding distally, ventral margin convex curving upward to apex, dorsal margin convex distally, apical process narrow, angulately bent posteriorly to lie close to apical margin.

Anal segment of female long and fairly broad. Ovipositor with third valvulae ovate in profile, small and unarmed.

Genotype, *Poeciloptera paupera* Walker, 1858, List Hom. Suppl.: 119.

This genus is near to *Euhyopectera* Fenn. to judge by tegminal shape and characters of the genitalia. *O. paupera* Wlk. has a white transparent area on the tegmina at the level of the node which invades the costal margin; in the other species of this genus, *O. coffeacola* Dozier, the pale transparent spot is round and does not attain the costal margin. This genus is known only from Hispaniola.

ACANTHOFLATA gen. nov.

Frons slightly longer than wide, median carina present basally, lateral margins carinate; vertex almost twice as wide as long, disc depressed. Pronotum anteriorly convex, posteriorly concave; mesonotum twice as long as pronotum, feebly carinate. Tegmina three times as long as broad, costal margin strongly convex in basal half, slightly concave distally, sutural margin straight or slightly concave meeting costal margin distally in a narrow point; clavus long, gibbous at base.

Anal segment of male only slightly deflexed distally, twisted to form a median vertical plate distad of anal foramen. Genital styles with dorsal and ventral margins fairly straight, apical process in profile in form of a sinuate lobe with a sickle-shaped decurved spine at posterior extremity.

Anal segment of female large, ovate. Ovipositor with third valvulae small, ovate, devoid of teeth.

Genotype, *Rhynchopteryx salina* Dozier, 1927, *Jour. N. Y. Ent. Soc.* xxxv:53.

In the shape of the costal margin, of the anal segment of the male, and to a lesser degree of the aedeagus and genital styles this genus is most nearly related to *Euhyloptera*.

CAPISTRA gen. nov.

Frons as long as broad, median carina strongly present in basal half, absent from apical half, lateral carinae only indicated at base, lateral margins carinate, no carinae on clypeus, vertex broader than long (4:1). Pronotum slightly overlapping vertex anteriorly, somewhat emarginate behind eyes, deeply roundly excavated posteriorly; mesonotum broader than long, median and lateral carinae weakly present at base, obsolete on disc. Post-tibiae bispinose. Tegmina 2.5 times as long as wide, costal margin convex near base, slightly concave near node, tapering slightly to level of nodal line, symmetrically and almost semicircularly rounded at apex; costal area granulate, three times as broad as costal cell, Sc simple to apex, R forking beyond middle of tegmen, M forking near basal third, Cu forking distad of M fork; nodal line somewhat irregular but distinct, apical line subparallel to apical margin, even and distinct, apical veins frequently shortly forked. Wings with R simple, M forked once.

Anal segment of male in profile with sides deep near base, narrowing apically; apical third of segment medially grooved and deflexed. Genital styles moderately broad, narrowing distally, apical margin rounded, apical process a stout vertical spine.

Anal segment of female short and broad. Ovipositor with third valvulae beset distally with nine stout teeth, eight in a row and one tooth distinctly basad near dorsal margin; second valvulae tapering distally, first valvulae with three rounded teeth on lower margin and three minute teeth on upper.

Egg elongate-oval, 0.9 mm. long, 0.3 mm. wide, minutely reticulate at narrower pole.

Genotype, *Capistra montana*, n. sp.

Capistra montana n. sp.

Male. Length, 5.5 mm.; tegmen, 6.4 mm. Female. Length, 5.6 mm.; tegmen, 6.8 mm.

Vertex, pronotum and mesonotum testaceous or fuscous, frons narrowly infusate at base, otherwise stramineous; clypeus, sides of thorax and legs stramineous; abdominal sclerites and genitalia fuscous, membrane pallid. Tegmina stramineous, slightly clouded fuscous beyond nodal line, two small dark spots between M and fork of Cu, clavus dark at base. Wings clouded fuscous. Insect in life powdered pale tawny or fawn.

Aedeagus tubular, curved upward near apex, terminating on each side apically in a knob, denticulate posteriorly; ventro-laterally on each side a long curved process, slightly expanded and blade-like near tip, directed ventrally and anteriorly.

Ovipositor with second valvulae with ventral margin straight, apex pointed, dorsal margin convex near base, sinuately narrowing distally, a transparent dome-like eminence just before apex.

Described from four males and five females taken by the writer in mountain forest near Ottley's Level, St. Kitts, B. W. I. (Sept. 10, 1943). Type in British Museum, allotype female and paratype male in U. S. N. M. This genus is readily recognizable by the shape of the tegmina and by their rather shallowly tectiform carriage.

EXPLANATION OF PLATE VI

1. *Psenoflata brevis*, Fenn., tegmen.
2. *Flatiris plumbea* Fenn., tegmen.
3. *Riculiflata perpusilla* Fenn., tegmen.
4. *Anthoflata ingae* Fenn., tegmen.
5. *Alcazor pallidus* Fenn., tegmen.
6. *Antillormenis martinicensis* Fenn., anal segment, (a) posterior view of process.
7. Idem, genital style.
8. Idem, aedeagus.
9. Idem, ventral margin of pregenital sternite of female.
10. Idem, ventral margin of pregenital sternite, profile.
11. *Ilesia falcata* Fenn., anal segment, pygofer and genital style.
12. Idem, aedeagus.
13. Idem, medial excavation in posterior margin of pregenital sternite.
14. *Euhyopectera antillana* Fenn., anal segment, pygofer and genital style.
15. Idem, aedeagus, (a, b) details of process with filament removed.
16. Idem, egg.
17. *Anthoflata ingae* Fenn., aedeagus.
18. Idem, egg.
19. Idem, second valvulae of ovipositor.
20. *Flatiris plumbea* Fenn., second valvulae of ovipositor.
21. Idem, egg (a) anterior view, (b) side view.
22. *Alcazor pallidus* Fenn., anal segment, pygofer and genital style.
23. Idem, aedeagus.
24. *Capistra montana* Fenn., anal segment.
25. Idem, aedeagus, (a) posterior ventral margin of periandrium.
26. Idem, second valvulae of ovipositor.
27. Idem, genital style.
28. Idem, tegmen.

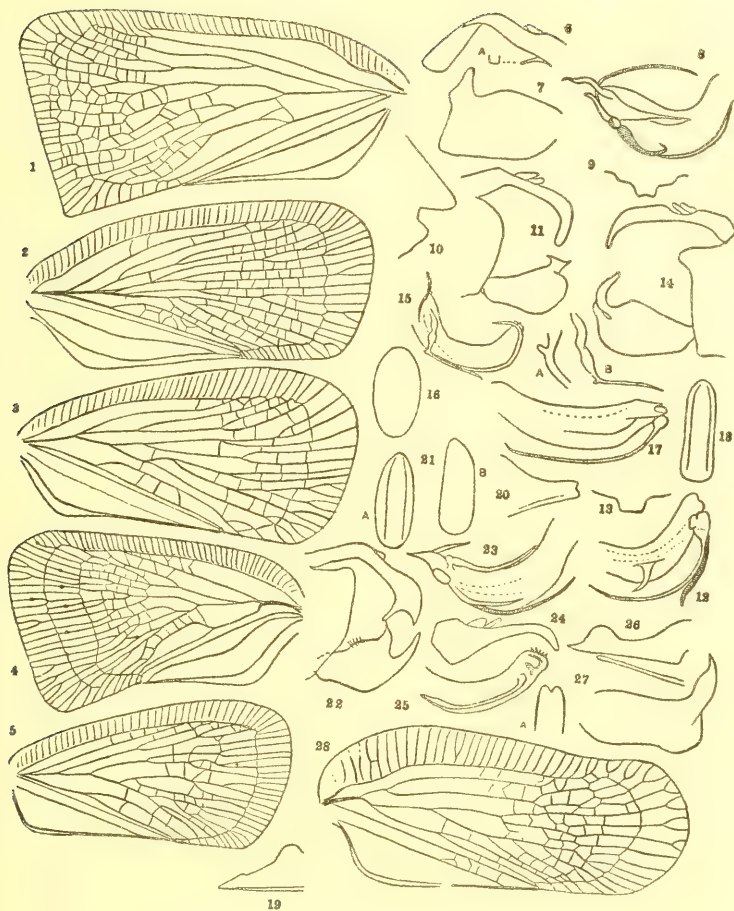


Plate VI. West Indian Flatidae

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW RACES OF ASIATIC BROADBILLS
(EURYLAIMIDAE)

By H. G. DEIGNAN*

A study of populations of broadbills of the genera *Corydon*, *Psarisomus*, *Eurylaimus*, and *Calyptomena* has shown that the following are worthy of nomenclatorial recognition:

1. *Corydon sumatranus pallescens*, subsp. nov.

Type.—U. S. National Museum No. 210611, adult male, collected at the Semangko Pass (elev. 2,500-4,500 ft.), Selangor-Pahang Boundary, Malaya, on February 23, 1908, by collectors for the Selangor State Museum (original number 630/08).

Diagnosis.—Separable from *C. s. sumatranus* (Sumatra) by having the throat and upper breast dark sullied buff, *not* rufescent.

Range.—Malay Peninsula, from Johore State north to the Siamese province of Trang (where, however, four specimens out of nine are referable to the next race).

Remarks.—The dogmatic statement of Robinson and Boden Kloss (Journ. Nat. Hist. Soc. Siam, vol. 5, 1923, p. 204) that "Continental and Sumatran birds do not differ" is refuted by my ample material.

2. *Corydon sumatranus morator*, subsp. nov.

Type.—U. S. National Museum No. 324561, adult female, collected at Ban Sichon, peninsular Siam at lat. 9°00' N., long. 99°55' E., on September 3, 1929, by Hugh M. Smith (original number 3282).

Diagnosis.—From *C. s. pallescens* (Malaya) distinguished by having the throat and upper breast a paler, less sullied buff—its tone just intermediate between those shown by *pallescens* and *laoensis* (northern Siam).

Range.—Malay Peninsula, from the Siamese province of Trang (where, however, five specimens out of nine are referable to the preceding race) north to the Isthmus of Kra and possibly farther.

Remarks.—Since no specimens have been seen from southwestern Siam, it is impossible for me to decide at what point *morator* changes to *laoensis*.

3. *Corydon sumatranus ardescens*, subsp. nov.

Type.—U. S. National Museum No. 333792, adult female, collected on Khao Sa Bap (lat. 12°35' N., long. 102°15' E.) a mountain in Chanthaburi Province, southeastern Siam, on November 20, 1933, by Hugh M. Smith (original number 6715).

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Diagnosis.—With the color of the throat and upper breast quite as in *C. s. morator* (peninsular Siam), but with the concealed dorsal patch a deeper and purer red, much as in *brunnescens* and *orientalis* (both of Borneo), not orange red.

Range.—Southeastern Siam.

4. *Corydon sumatranus khmerensis*, subsp. nov.

Type.—U. S. National Museum No. 278370, adult male, collected at Da Ban (lat. 12°38' N., long. 109°06' E.), Phanrang Province, southern Annam, on March 23, 1918, by Cecil Boden Kloss.

Diagnosis.—With the throat and upper breast as light a buff as in *C. s. laeensis* (northern Siam), but with the concealed dorsal patch as deep and pure a red as in *ardescens* (southeastern Siam) and the Bornean races.

Range.—Western Cambodia, southern Annam, and possibly Bas-Laos.

5. *Psarisomus dalhousiae divinus*, subsp. nov.

Type.—U. S. National Museum No. 360744, adult female, collected on the Lang Bian Mountains (ca. lat. 12°02' N., long. 108°26' E.), Haut-Donai Province, southern Annam, in December 1939, by Joseph F. Rock (original number 1155).

Diagnosis.—Distinguished from *P. d. assimilis* (as exemplified by specimens from northern Siam) by having the green of the upper parts slightly deeper in tone and brighter; the color of the rectrices nearer Paris blue (Ridgway) than Italian blue (Ridgway), with the green suffusion of their outer webs reduced in extent and restricted to the two or three outermost pairs; the nuchal patch (whether the blue one of the male or the blue-edged golden yellow one of the female) more extensive and much more clearly defined.

From *P. d. cyanicauda* (southeastern Siam) separable by having the green of the upper parts deeper in tone and very much brighter; the color of the supra auricular patch golden yellow rather than creamy; the nuchal patch (whether the blue one of the male or the blue edged golden yellow one of the female) more extensive and much more clearly defined.

Range.—Southern Annam.

Remarks.—My diagnosis is based entirely upon series of fresh-plumaged winter-taken specimens of the three races mentioned.

6. *Eurylaimus javanicus friedmanni*, subsp. nov.

Type.—U. S. National Museum No. 331966, adult male, collected at Sathani Hin Lap, eastern Siam at lat. 14°40' N., long. 101°10' E., on December 7, 1931, by Hugh M. Smith (original number 5205).

Diagnosis.—From *E. j. pallidus* (peninsular Siam) easily separable by having the throat and upper breast more strongly washed with metallic gray, so that these parts are rosy violet, rather than deep vinaceous rose; the remaining under parts lightly overlaid with metallic gray, so that the general coloration is a paler, more violet, less vinaceous, rose.

Range.—Eastern and southeastern Siam, Bas-Laos, southern Annam, and Cochinchine.

Remarks.—This race is named in honor of Herbert Friedmann, Curator of Birds at the United States National Museum.

7. *Calyptomena viridis gloriosa*, subsp. nov.

Type.—U. S. National Museum No. 182844, adult male, collected on the Sungei Karangan, central-eastern Borneo at ca. lat. 1°20' N., long. 117°38' E., on November 9, 1913, by Harry C. Raven (original number 1114).

Diagnosis.—Separable from the non-Bornean races by having the greens, especially below, deeper and richer (more blue-green, less grass green) and, when viewed laterally, distinguished from all other forms by having the black-barred portion of the wing equal to more than one-half of the total wing length (whereas in the others the black-barred portion constitutes less than one-half of the total wing length).

Range.—Eastern Borneo.

Remarks.—Inasmuch as birds from continental Asia have the wing length averaging longer than those of eastern Borneo (11 adult males of *caudacuta*: 97-107 mm.; 4 of *continentis*: 101-103 mm.; 11 of *gloriosa*: 91-99 mm.), the extent of barring on the wings can be mathematically indicated only in ratios. Where B represents the distance from the posterior edge of the outermost bar to the tip of the longest primary, W the total wing length, the several series before me yield the following results:

<i>gloriosa</i> (eastern Borneo, 11)	B : W = 38.48 : 100
<i>caudacuta</i> (Malaya, 11)	B : W = 54.66 : 100
<i>continentis</i> (peninsular Siam, 4)	B : W = 51.55 : 100

Three specimens from southwestern Borneo have the coloration of *gloriosa*, but the wing pattern of *caudacuta* and *continentis* (B : W = 54.60 : 100). Since they differ in color from *caudacuta*, it may be assumed that they will differ also in this character from *viridis*; in the absence of Sumatran material, however, I prefer to leave them unnamed for the present.

Examples from the southern third of the Malay Peninsula (Johore State north to the Siamese provinces of Pattani and Trang) differ from virtual topotypes of *continentis* by their decidedly duller grass green coloration (with this distinction especially evident in the green wing bars). Since they are almost certain to be distinct from *viridis* (Sumatra: Benkulan, by restriction), I prefer to call them *caudacuta*, with reference to

Calyptomena caudacuta Swainson, *Animals in Menageries*, pt. 3 [Two Centenaries and a Quarter of Birds . . .], Dec. 31, 1837 or Jan. 1, 1838, p. 296, fig. 48 b ("India," error; type locality corrected to Singapore Island, Malaya, by Chasen, *Handlist of Malaysian Birds*, 1935, p. 153).

Material examined (all in the collection of the U. S. National Museum):

<i>Corydon sumatranus brunnescens</i>	2 specimens
<i>sumatranus</i>	4 "
<i>pallescent</i>	8 "
<i>morator</i>	11 "
<i>ardescens</i>	12 "
<i>khmerensis</i>	3 "
<i>laocensis</i>	23 "

<i>Psarisomus dalhousiae borneensis</i>	3 specimens		
<i>psittacinus</i>	1	"	
<i>cyanicauda</i>	8	"	
<i>divinus</i>	18	"	
<i>assimilis</i>	23	"	
<i>Eurylaimus javanicus brookei</i>	3 specimens		
<i>harterti</i>	4	"	
<i>pallidus</i>	7	"	
<i>friedmanni</i>	22	"	
<i>Calyptomena viridis siberu</i>	1 specimen (adult males)		
<i>continentis</i>	4 specimens		"
<i>caudacuta</i>	11	"	"
<i>gloriosa</i>	11	"	"
subsp. <i>innom.</i>	3	"	"

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PUERTO RICAN FERN NOTES

BY WILLIAM R. MAXON

A little more than 20 years ago the writer contributed to "Botany of Porto Rico and the Virgin Islands," the text of the Pteridophyta, occupying pages 373 to 522 of the second volume given to the "Descriptive Flora," following the treatment of the flowering plants by Britton and Wilson.¹ In the interim several lots of Puerto Rican ferns have been received for study, the more important of these being the recent collections by W. H. Wagner, Jr., a series of nearly 300 specimens collected in 1941 by H. L. Blomquist, and two lots collected by F. H. Sargent, of the U. S. Geological Survey, while engaged in topographic work. Mostly from this material the following notes have been compiled. They consist of new records for the island (including one new species), doubtful earlier occurrences now to be validated, additional locality records for a few of the rarer species, and a nomenclatural correction to the writer's systematic treatment of 1926.

As will be noted, special interest attaches to the material collected by Mr. Sargent in the Jayuya district, in the west-central part of the island. This relatively restricted tract of the Cordillera Central, covering some 7 or 8 square miles along the main east-west ridge and secondary spurs above 1,100 meters, culminates in the Cerro de la Punta, altitude 1,339 meters, the highest peak in the island. On the Soil Survey map of Puerto Rico² this zone carries the specific legend "shallow, brown, lithosoles; hard rocks; trees." It is uninhabited jungle, with few trails, and surely would well repay thorough exploration. Mr. Sargent calls attention also to a half dozen isolated patches of a square mile or less of the same

¹Britton, N. L., and Wilson, Percy. Botany of Porto Rico and the Virgin Islands. Descriptive Flora—Spermatophyta. Sci. Survey Porto Rico & Virgin Ids. 5: 1-371 (1923-1924); 6: 1-371 (1925-1926).

²Roberts, R. C. Soil Survey of Puerto Rico. U. S. Department of Agriculture. Bureau of Plant Industry, in cooperation with the University of Puerto Rico Agricultural Experiment Station. 503 pp. 1942.

formation in the vicinity of Adjuntas, Monte Guilarte falling in this group. The largest tract of all lies far to the eastward, at a slightly lower elevation, in the region of El Yunque, which was long thought to be the highest point in Puerto Rico. There are doubtless many species still to be added from this zone.

In Pteridophyta of Porto Rico the number of species recognized is 285. The additions here recorded bring the total to 303.

MARATTIACEAE

Danaea Jenmani Underw. Bull. Torrey Club 29:677. 1902.

Apparently uncommon, having been cited previously only from Mt. Andubo, near Adjuntas (*Sintenis* 4681). A recent collection, agreeing well with typical Jamaican material, is from forest at Jayuya, altitude 1,000 meters, Aug. 15, 1943, *F. H. Sargent* 3034.

GLEICHENIACEAE

Dicranopteris rubiginosa (Mett.) Maxon, Contr. U. S. Nat. Herb. 24: 50. 1922.

New to Puerto Rico. The very fragmentary specimen upon which this record is based was collected in 1926 upon the upper slopes of Cerro de la Punta by H. A. Gleason and Mel T. Cook (no. P. 33). In the Pteridophyta of Porto Rico (p. 384)³ it was mentioned as related to the South American *D. rubiginosa*, and now may be definitely referred to this species. It agrees essentially with fairly ample specimens since received from Colombia, Venezuela, and Peru, the whole series showing only moderate variation.

SCHIZAEACEAE

Anemia portoricensis Maxon, N. Amer. Fl. 16:48. 1909.

Excellent additional material of the present endemic species is at hand from a new locality: Km. 68, Utuado-Arecibo Road, on a forest ledge, Sept. 12, 1943, *F. H. Sargent* 3100.

CYATHEACEAE

Cyathea dryopteroides Maxon, Amer. Fern Journ. 14:99. 1925.

Apparently known until now from the original collection only: Monte Cerote, *Britton & Brown* 5424. It may be reported also from Jayuya, altitude 1,175 meters, in forest, the specimen collected by *F. H. Sargent* (no. 3141), Sept. 19, 1943.

POLYPODIACEAE

Elaphoglossum serpens Maxon & Morton, sp. nov.

♂ *Stenoneura*, *Conformia*. Rhizoma late repens, gracile (1.5–2 mm. diam.), non ramosum, olivaceo-brunneum, parce radicosum, apice et

³A considerable number of separates of the writer's contribution were distributed under the title "Pteridophyta of Porto Rico and the Virgin Islands." Christensen, Domin, and other writers have, as a matter of convenience, used this shorter title, although it is not technically correct. The pagination cited is that of the volume as a whole.

nodis paleaceum, paleis subaxe imbricatis, lanceolatis, 3-4 mm. longis, ca. 1 mm. latis, apice attenuatis, firmis, lucidis, castaneis, supra basin pallidorem leviter affixis, hic laxe fibrillosis, sursum subdenticulatis; folia pauca, inter se 1-3 cm. remota, erecta, valde difformia. Folia sterilia 7-13 cm. longa, stipitibus quam laminis multo longioribus, gracilibus, stramineis, nudis, phyllopodiiis fuscis, usque ad 15 mm. longis; laminae ovatae, apice obtusae, basi cuneatae, 3-6 cm. longae, 2-3 cm. latae, coriaceae, margine cartilaginea, supra parvissime et infra remote et minute paleaceae, paleis plerisque subrotundis ambitu, 0.45-0.6 mm. diam., profunde et irregulariter partitis, radiis 7-10, cellula apicali saepe glandulosa; venae liberae, sub angulo ca. 70° egredientes, prope basin et sursum iterum saepe furcatae, infra vix elevatae, apice paululo incrassatae, marginem attingentes. Folia fertilia 12-18 cm. longa, stipitibus bisulcatis, quam laminis triplo longioribus; laminae lanceolato-ellipticae, 3-4.5 cm. longae, 1-1.5 cm. latae, apice rotundatae, basi cuneatae, subdecurrentes, costa epaleacea, marginibus cartilagineis subrevolutis; sporangia longe pedicellata, ca. 0.3 mm. diam., annulo 13-16 articulo; sporae bilaterales, late reniformes, 45-50 μ longae, perspicue tuberculatae.

Type in the U. S. National Herbarium, no. 1,784,435, collected from a forest tree at Jayuya, Puerto Rico, altitude 1,300 meters, Sept. 10, 1943, by F. H. Sargent (no. 3115).

In Pteridophyta of Porto Rico this species, on account of its very slender, wide creeping, scantily paleaceous rhizome, would key to *E. glabellum* J. Sm., which, however, differs widely in its linear fronds and in most minute characters.

Habitally *E. serpens* suggests *E. squamipes* (Hook.) Moore, which is widely distributed in continental tropical America, but in that species not only the rhizomes but the stipes are conspicuously and persistently paleaceous and the scales of the blade, though distant as in *E. serpens*, are very many times larger. The narrow blades are of very different shape also, and in most respects there is no indication of close relationship with *E. serpens*.

Polypodium Hartii Jenman, Journ. Bot. Brit. & For. 24:272. 1886.

New to Puerto Rico. This species, described originally from Jamaica, has until now been known otherwise only from Guadeloupe, Dominica, and Grenada. The present record is based upon a single excellent plant collected from a forest tree at Jayuya, altitude 1,300 meters, Sept. 10, 1943, by F. H. Sargent (no. 3090a).

Polypodium attenuatum Humb. & Bonpl.

New to Puerto Rico. The specimen, a single frond with rhizome, was collected from a dry rock crevice near the base of a waterfall one mile east of El Valle, in the Luquillo Mountains, about 12 miles from San Juan, by H. L. Blomquist (no. 11882), Sept. 28, 1941. Though undersized, it is unmistakably referable to this species.

Polypodium triseriale Swartz, Journ. Bot. Schrad. 1800²:26. 1801; Syn. Fil. 38, 231. 1806.

Now to the Puerto Rican flora. This species was collected on Tortola as long ago as 1913 by J. A. Shafer (no. 1149), but the specimen was

overlooked until recently. Christensen was doubtless right in adopting this name in place of *P. brasiliense* Poir. (1804), long in use.

***Hypolepis nigrescens* Hook.**

New to Puerto Rico, the specimens collected at Jayuya, altitude 1,300 meters, Sept. 19, 1943, by F. H. Sargent (no. 3154). This is a common species in the Blue Mountains of Jamaica (whence originally described), at altitudes ranging from 900 to 2,100 meters, and apparently is not uncommon in eastern Cuba at similar elevations. It is known also from eastern Mexico, Guatemala, Colombia, and Venezuela.

***Dryopteris resinifera* (Desv.) Weatherby, Contr. Gray Herb. 114:32. 1936.**

Under its synonym *Dryopteris panamensis* (Presl) C. Chr. this species was reported from Puerto Rico by Christensen in 1907, on the basis of a specimen in the Berlin Herbarium collected long ago by Balbis. Since neither this nor other material from the island was available for study, the species was omitted from Pteridophyta of Porto Rico, there being a suspicion that the Balbis specimen actually pertained to *D. opposita* (Vahl) Urban, a common and very closely related species now properly known as *D. contermina* (Willd.) Kuntze. That *D. resinifera* does occur in Puerto Rico, however, is made clear by a characteristic medium sized plant in the National Herbarium, collected in March, 1944, eight miles southwest of Carolina by W. H. Wagner, Jr. Though abundant in Jamaica, Cuba, and Hispaniola, this species very evidently is rare in Puerto Rico.

***Dryopteris rudis* (Kunze) Kuntze**

New to Puerto Rico. The specimen, an excellent mature frond, was collected near Jayuya, at 1,000 meters elevation, in forest, by F. H. Sargent (no. 3147), Sept. 19, 1943. The type of *D. rudis* is from Mexico (*Schiede*), and the species ranges thence to Bolivia, occurring also in Jamaica and Cuba.

***Dryopteris Sprengelii* (Kaulf.) Kuntze**

This widely distributed and variable tropical American species is common in Puerto Rico. An extreme form perhaps referable to var. *longipilosa* C. Chr. was collected along the road up El Yunque, April 23, 1944, by W. H. Wagner; it is rather strongly pilose upon the rachises beneath.

***Dryopteris asplenioides* (Swartz) Kuntze**

As noted in Pteridophyta of Porto Rico (p. 480), *Dryopteris asplenioides* was recorded from the island by Urban, but on the basis of specimens which proved referable to *D. reptans* (Gmel.) C. Chr., *D. domingensis* (Spreng.) Maxon, *D. leptocladia* (Fée) Maxon, and *D. hastata* (Fée) Urban. Recently, however, it has been collected by F. H. Sargent in two localities, viz. near Jayuya, altitude 1,000 meters, in forest, Sept. 1943 (nos. 3148, 3149); Utuado, altitude 350 meters, on dry cliffs, Nov. 12, 1943 (no. 3273). The material is ample, and accords well with specimens from Jamaica, Hispaniola, and Cuba.

***Asplenium rutaceum* (Willd.) Mett.**

This species should have been included in Pteridophyta of Porto Rico, the Schwanecke specimen there mentioned (p. 453) having been correctly so identified by Urban.⁴

***Dryopteris cordata* (Fée) Urban**

This species was recorded from Puerto Rico by Urban on specimens collected by Sintenis (nos. 6380, 6588) at Utuado. In part I of his monograph of *Dryopteris* these were discussed briefly (p. 216) by Christensen as resembling *D. cordata* in shape of the pinnae but still to be regarded preferably as young states of *D. reptans*. Accordingly *D. cordata* was omitted from Pteridophyta of Porto Rico by the writer. A specimen of *Sintenis* 6588 in the National Herbarium has, however, been annotated by Christensen as *D. cordata*, and that is correct. From the same locality, Utuado, we now have fine, fully mature material collected Nov. 12, 1943, by F. H. Sargent (no. 3272), these agreeing perfectly with a good series of specimens from Cuba, the type region. There can be no doubt as to the specific distinctness of this form.

HYMENOPHYLLACEAE

***Trichomanes robustum* Fourn. Bull. Soc. Bot. France 15:147. 1868.**

There is at hand a single specimen, collected on the south side of El Yunque, May 2, 1942, by H. L. Blomquist (no. 13206). This agrees closely with a wealth of material collected in the Blue Mountains of Jamaica at 1,500 to 1,925 meters elevation (e. g. *Maxon* 2720, 9744, 10219 10257; *Maxon & Killip* 937, 988) previously called *Trichomanes accedens* Presl but now referred definitely to *T. robustum* Fourn. by Mr. Weatherby, who has studied this group critically. New to Puerto Rico.

Trichomanes robustum was described originally from Guadeloupe. It is distinguished from *T. crispum* by its scant hairiness and, notably, by its wide-creeping, freely branched rhizomes and remote fronds. In *T. crispum*, which is by far the commoner species, the fronds are very hairy and are fasciculate upon an oblique to short-creeping rhizome.

***Hymenophyllum contortum* v. d. Bosch**

The species under discussion is the one taken up by the writer in Pteridophyta of Porto Rico (p. 504) mistakenly as *Hymenophyllum crispum* H. B. K. The fronds are conspicuously undulate-crispate throughout, a circumstance which led Jenman⁵ first to the misidentification mentioned; but they are glabrous, and that is not a character of true *H. crispum*, which has ciliate margins. The facts have recently been stated by Morton,⁶ who takes up *H. crispum* in the proper sense, with synonymy of several species proposed by van den Bosch, Christ, and Rosenstock. It belongs to the section *Sphaerocionium* and ranges through most of tropical America.

The proper name for the widely distributed glabrous plant in question (§*Mecodium*) is apparently *Hymenophyllum contortum* v. d. Bosch, though it is not unlikely that an earlier one will eventually be found. The Puerto Rican specimens at hand (*Hess* 225, *Stevens* 1977, *Gleason* 43, *Sargent* 3083) are all from high elevations. It is an abundant

⁴See Proc. Biol. Soc. Washington, 46:142. 1933.

⁵Bull. Bot. Dept. Jamaica, no. 16, 5. 1890.

⁶Contr. U. S. Nat. Herb. 29: 160-161. 1947.

species in Jamaica, mostly above 1,500 meters, and occurs also in Cuba, Hispaniola, and Guadeloupe. On the continent it ranges from Mexico to Bolivia.

***Hymenophyllum protrusum* Hook.**

New to Puerto Rico, the specimen having been collected on the slopes of El Yunque, April 16, 1944, by W. H. Wagner, who noted it as "abundant on tree trunks."

This species, well though briefly described by Hooker, was reduced to varietal rank under *H. polyanthos* Swartz by Christensen, notwithstanding its having been maintained by so conservative a botanist as Jenman. The writer has collected abundant material of it in Jamaica, at 500 to 900 meters elevation, in wet forest. There it usually grows on fallen tree trunks or preferably upon upright decaying trunks at a height of 3 to 10 meters, the numerous slender fronds laxly pendent, overlapping, and often as much as 35 cm. long. Specimens of this sort are readily distinguished from *H. polyanthos*, variable as that species may be, habitally and otherwise.

***Hymenophyllum fucoides* Swartz**

A not unexpected new record for this widely distributed tropical American species. The specimen is from Monte Guilarte, at 1,200 meters altitude, Nov. 7, 1943, *F. H. Sargent* 3267. It agrees perfectly with typical Jamaican material and with specimens from Cuba and Hispaniola.

***Hymenophyllum elegantulum* var. *petiolulatum* Morton, Contr. U. S. Nat. Herb. 29:171. 1947.**

This recently described variety is based upon material collected at Jayuya, altitude 1,200 meters, Sept. 19, 1943, by *F. H. Sargent* (no. 3144). It was first collected on the upper slopes of Cerro de la Punta by Gleason and Cook (no. P.40), and is mentioned in Pteridophyta of Porto Rico (p. 507) as perhaps new. Mr. Morton reports it also from Costa Rica.

From the typical form of the species, which is of wide distribution in tropical America, var. *petiolulatum* differs in having the lowest pinnae petiolulate.

***Hymenophyllum lanatum* Fée**

In Pteridophyta of Porto Rico (p. 507) *Hymenophyllum hirsutum* (L.) Swartz is listed as having been reported from Puerto Rico by Urban on the basis of a plant collected by Schwanecke. As mentioned elsewhere,⁷ the specimen, which was received on loan from Berlin in 1930, turned out to be a depauperate plant of *H. lanatum* Fée, a common West Indian species not otherwise known from Puerto Rico.

***Hymenophyllum Sieberi* (Presl) v. d. Bosch**

This species, described originally from Martinique and until now known otherwise in the West Indies only as reported from Guadeloupe by Christ, is represented in the National Herbarium by two recent Puerto Rican specimens, cited by Mr. Morton in his recent paper on

⁷Proc. Biol. Soc. Washington 46: 144. 1933.

the section *Sphaerocionium*, both from El Yunque: April 10, 1938, *F. H. Sargent*; Feb. 23, 1942, *H. L. Blomquist* 12741. On the continent *H. Sieberi* ranges from southern Mexico to Costa Rica, where it is not uncommon, having been described as a new species, *H. Wercklei* Christ, in 1904.

SALVINIACEAE

***Salvinia rotundifolia* Willd.**

The present species, though occupying a wide range in continental tropical America, has not previously been reported from Puerto Rico. Two specimens are at hand. One, collected at the Mayaguez Experiment Station by David G. White in 1946, bears the notation "becoming a serious pest." The other, from a slow-moving stream near Carolina, on the road to Rio Piedras, Feb. 14, 1942, *H. L. Blomquist* 12616, was very likely derived from escaped material. This species is commonly cultivated and is known to have become naturalized in Bermuda.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SHREW (GENUS SOREX) FROM COAHUILA

By HARTLEY H. T. JACKSON

In the winter of 1941-1942, F. W. Miller, of the Dallas Museum of Natural History, Dallas, Texas, sent to the U. S. Fish and Wildlife Service for identification and study a collection of mammals that he had made in Sierra del Carmen, Coahuila, México, during the two preceding autumns. Many of the specimens have been kindly donated to the Biological Surveys collection by Mr. Miller, who will publish the results of both his field and the laboratory studies. Among the material are specimens of a heretofore unknown shrew, which is herewith named for the collector in recognition of his mammalogical work, and which may be recognized by the following description:

Sorex milleri, sp. nov.

Carmen Mountains Shrew

Type-specimen.—No. 274,950, U. S. National Museum, Biological Surveys collection; ♀ (?) adult, skin and skull; collected November 1, 1940, by F. W. Miller. Original number 19; Biological Surveys miscellaneous 32,327X.

Type-locality.—Madera Camp, altitude 8,000 feet, Carmen Mountains, Coahuila, Mexico.

Diagnostic characters.—Smallest of the *vagrans-obscurus* group, to which it apparently belongs. Color slightly more grayish than in *Sorex vagrans monticola*; distinctly paler and more grayish than in *S. v. orizabae*. Skull small (smallest of the *vagrans-obscurus* group), flattened, relatively broad interorbital constriction; dentition weak, the third upper unicuspid scarcely if any smaller than the fourth, almost equal to it in size.

Color.—Type specimen and topotype apparently in fresh winter pelage: upper parts between hair brown (colors of Ridgway, *Color standards and color nomenclature*, 1912) and drab, a little nearer drab; sides and flanks a trifle paler, drabbish; under parts pale smoke gray tinged with vinaceous buff; tail bicolor, light drab above, pinkish buff below.

Measurements.—Type-specimen: Total length, 95; tail vertebrae, 44; hind foot, 11. Skull of type-specimen: Condylbasal length, 15.5; palatal length, 10.2; breadth of cranium, 7.4; interorbital constriction, 3.7; maxillary breadth, 4.4; maxillary tooth row, 5.5.

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NATIONAL MUSEUM
OCT 10 1947

Remarks.—*Sorex milleri* is a small shrew, apparently of the *vagrans-obscurus* group, of which it is the smallest representative. It is known only from the type-locality in the Carmen Mountains, Mexico, whence are two specimens besides the type. One of these No. 274,951, U. S. National Museum, Biological Surveys collection is a mummy from which the imperfect skull has been removed. The other, F. W. Miller original number 20, deposited in the Dallas Museum of Natural History, is a skin with imperfect skull, the cranium being broken away and only the rostral part of skull remaining. The first upper incisors in the type-specimen are missing, so actually we do not yet have a perfect specimen of this form. Although the material seems to indicate affinities of this form with *Sorex vagrans*, there are no geographic intergrades and the specimens set themselves out clear-cut from *Sorex vagrans orizabae*, the nearest representative of that species. It seems best, therefore, under the circumstances to designate the form as a distinct species.
U. S. Fish and Wildlife Service, Washington, D. C.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A MASTIFF BAT (GENUS *EUMOPS*)
FROM SONORA, MEXICO

BY SETH B. BENSON, *Museum of Vertebrate Zoology, University of California*

Mastiff bats (Genus *Eumops*) obtained in 1938 and 1939 in west-central Sonora represent a previously unnamed species.

Eumops sonoriensis, new species

Type.—Old adult male, skin and skull, no. 82150 Mus. Vert. Zool., obtained at Rancho de Costa Rica, 270 feet elevation, Rio Sonora, Sonora, on May 2, 1938. Original number 5413 Seth B. Benson.

Diagnosis.—A large species (forearm averaging 67 mm.). Ears moderately large, not projecting beyond muzzle, closely approximated on forehead but separate. Tragus small, narrow, blunt at tip, and slightly curved forward. Antitragus large and low. Keel of auricle averaging 21 mm. in length (measured from anterior part of pinna to posterior end of keel). Skull short and wide, with strong sagittal and lambdoidal crests, dorsal profile from nares to occiput nearly straight, interorbital region distinctly hourglass-shaped, basisphenoid pits oval, shallow and small. Mandible heavy and wide.

Comparisons.—Compared with *Eumops perotis* (Wied), 1825, and *Eumops californicus* (Merriam), 1890: Smaller (forearm averaging 67 mm. instead of more than 70 mm.); ears much smaller (keel averaging 21 mm. rather than about 30 mm.), not joined on forehead and not projecting past muzzle; skull shorter and relatively wider, interorbital region distinctly hourglass-shaped rather than nearly cylindrical; mandible relatively broader, the ratio of the greatest width across angular processes to the mandibular length (measured from anterior face of incisors to the plane between both condyles) averages 83 in *E. sonoriensis* and 68 in *E. californicus*. Compared with *Eumops underwoodi* Goodwin, 1940: Similar in most characters but averaging smaller, ears about equal in size and similar in shape but not connected across forehead; skull smaller, more delicate in structure, brain case relatively less inflated, interorbital region less inflated posterior to the lacrimal processes, lambdoidal crest relatively wider and less sharply distinct from ridge running to mastoidal processes, basisphenoid pits smaller, shallower and less sharply defined, dentition less massive (greatest width of m^2 from cingulum of protocone to outside of mesostyle averaging 3.6 (3.5-3.8) mm. in *E. sonoriensis* and 4.3 in *E. underwoodi*). Color paler. Needs no close comparison with other species of *Eumops* (see Sanborn, 1932, Journ. Mammalogy, vol. 13, p. 348) all of which are distinctly smaller.

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For example, in *Eumops glaucinus*, the largest of these species, the condylobasal length of skull, according to Sanborn, ranges from 21.3 to 23.3 mm. In *E. sonoriensis*, this measurement ranges from 26.1 to 28.0. The skull of *E. sonoriensis* is about 50 per cent greater in bulk than that of *E. glaucinus*.

Measurements.—Average, minimum and maximum measurements, in millimeters, of 11 specimens (10 ♂♂, 1 ♀). Total length, 167 (159-185), tail, 56 (44-67), hind foot (dry), 16.3 (15.0-17.5), ear from notch, 29 (27-30), weight in grams, 47.9 (40.0-55.6), forearm, 67.4 (65.3-69.8), condylobasal length, 26.7 (26.1-28.0), zygomatic breadth, 17.4 (16.7-17.9), lacrimal breadth, 9.9 (9.2-10.2), least interorbital width, 5.7 (5.4-5.9), mastoid breadth, 15.2 (14.8-15.7), width at m^3 , 11.9 (11.5-12.2), maxillary toothrow (from anterior face of canine above cingulum to posterior face of m^3), 11.4 (11.1-11.7), postpalatal length (border of palatal notch, not including median spine, to anterior lip of foramen magnum), 12.1 (11.6-12.6), length of mandible (anterior face of incisors to plane of condyles), 20.5 (20.0-21.1), width between angular processes, 17.0 (16.2-17.7), width of m^2 (cingulum of protocone to mesostyle), 3.6 (3.5-3.8).

Color (capitalized color terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Dorsal hairs with tips Sayal Brown to Bister, paling to dirty white at bases, hairs of ventral surface with tips ranging from Light Pinkish Cinnamon to Avellaneous paling to white at base. In the paler specimens some of the ventral hairs are tipped faintly with white. The membranes are dark in color.

The range of variation in color is considerable and it is likely that the specimens, all taken in May, are somewhat faded. All, however, are less intensely pigmented than a March-taken specimen of *E. underwoodi*.

Specimens examined.—Total number 11, from Sonora, Mexico, as follows: Rancho de Costa Rica, Rio Sonora, 7 (3 skeletons); 10 mi. NW Noche Buena (approximately 18 mi. NNW Guaymas), 4.

Remarks.—The species *E. sonoriensis* resembles *E. underwoodi* so closely that it may eventually prove to be a geographic race of that species. However, the difference in the ears, joined in the one specimen of *underwoodi* I have examined, and free in the 8 skins of *E. sonoriensis*, together with the considerable difference in the size of the teeth, make it necessary to regard *E. sonoriensis* as a full species at present. There are many differences in details of structures of the skull, but, lacking knowledge of the range of variation in both species, it is impossible to judge whether or not these are specific.

The bats were obtained by trapping on wires stretched over the surface of pools of water.

I am indebted to Mr. G. G. Goodwin of the American Museum of Natural History for furnishing specimens of *E. underwoodi*, *E. abrasus*, and *E. glaucinus* for comparison.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE TUCO-TUCOS OF PERU (GENUS *CTENOMYS*)

By COLIN CAMPBELL SANBORN
Curator of Mammals
Chicago Natural History Museum
and
OLIVER P. PEARSON
University of California

The South American burrowing rodents of the genus *Ctenomys* reach their northern limit on the high plateau of southern Peru. The genus was formerly represented in this area by *Ctenomys opimus nigriceps* Thomas described from Tetiri, southwest of Puno, in 1900. Recently the Peruvian Zoological Expedition 1941-42 of Chicago Natural History Museum and Dr. Oliver P. Pearson collecting for the Museum of Comparative Zoology, Harvard University, have collected two other members of the genus, one of which proves to be a new species and is here described as

Ctenomys peruanus sp. nov.

Type from Pisacoma, alt. 14,000 ft., Department of Puno, southern Peru. No. 52467 Chicago Natural History Museum. Adult female, skin and skull. Collected September 1, 1941, by Colin C. Sanborn. Original number 2782.

Characters.—A large, pale, dark-footed species, with broadly expanding zygomatic arches, sagittal crest, and a reduced last molar.

Color.—Back, sides and belly Cream-Buff (Ridgway, 1912) heavily lined with black to give a general effect of Wood Brown. In the type and two other specimens a sharp molt line separates the back from the paler rump on which the hairs have much reduced dark tips or lack them entirely. Nose, lips, ears, and surrounding fur dark Clove Brown. In the type a line of the same color extends from the nose to between the ears but is faint or absent in other specimens. Hind feet dark Clove Brown, slightly lighter in some specimens. Tail like the feet or Tawny. Front feet color of body.

Skull.—Zygoma broadly expanding anteriorly, so much so that zygomatic width in adults is greater than distance between outer edges of the bony auditory meatus (hereinafter called the intermeatal width). The last molar is reduced, about one quarter the size of the other molars. Even in the females there is a sagittal crest. Top of skull moderately arched.

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Measurements.—Type (5 adult females in parentheses). Total length 310 mm. (271-327); tail 88 (68-89); hind foot 41 (34-41). Four males measured but not saved, total length 296-325; tail 80-89; hind foot 40-44, ear 8-10. Skull: (two topotypes in parentheses) greatest length 53.8 (54.9-55.8); condylo-basal length 50 (51.5-51.9); interorbital width 10.7 (11.1-12); zygomatic width 34.8 (34.9); intermeatal width 33.1 (34); width of brain case 19.7 (18.5-19.4); upper tooth row 11.2 (11.6-12.4); bullae 18.9×8.4 ($19.1-19.7 \times 8.5-8.7$); nasals 21.5×8.5 ($21.6-22.5 \times 9.3-8.8$).

Specimens examined.—Peru: Puno; Pisocoma 4 (C.N.H.M.), Mazocruz 3 (M.C.Z.).

Remarks.—The size, color pattern, and reduced last molar seem to indicate a relationship to *C. fulvus* and *C. robustus* of northern Chile. These are both larger, especially *robustus*, than *peruanus* and have larger bullae, less arched skulls, and a zygomatic width less than intermeatal width. For an animal like *Ctenomys* that may vary from one colony to another, there is not yet sufficient material from this region to determine subspecifically its exact relationship. There are still many localities in the mountains of southern Peru and northern Chile that have not been collected but where *Ctenomys* may exist.

Another species of tuco-tuco long known from Bolivia but not heretofore recorded from Peru is

Ctenomys leucodon Waterhouse

Ctenomys leucondon Waterhouse, Nat. Hist. of the Mammalia, 2, p. 281, 1848.

[*Ctenomys*] (*Haptomys*) [*leucondon*] Thomas, Ann. Mag. Nat. Hist., (8), 18, p. 304, 1916.

Specimens examined.—Peru: Puno; Rio Ceallacami, near Huacullani, 3 females (C.N.H.M.).

The general appearance of the backs of these specimens is close to Clay Color (Ridgway, 1912). The bases of all hairs are slate gray followed by either a very broad or very narrow band of Clay Color and tipped with black, the amount of black depending on wear. The head and between the ears is much darker, the sides of muzzle and cheeks close to Buckthorn Brown. The under parts near Tawny Olive, more reddish on chest. This agrees in general with Waterhouse's description. The tail is dark brown above and faintly lighter beneath, not dirty white as given in the original description and without a crest of long whitish hairs. The hairs on the feet are grayish white rather than pale rufous. The ridge on the under side of the nails appears to be longer than noted by Waterhouse.

Measurements.—Total length 265-278; tail 68-78; hind foot 35. Skull: greatest length 48.9-49.1; condylo-basal length 45.4-45.7; zygomatic width 30.4-30.6; intertemporal width 10-11; interorbital width 8.2-8.9; greatest width across bulba 8.9-8.9; width back of zygoma 18.5-18.9; diastema 13.9-13.9; length upper tooth row 9.9-10.2.

Remarks.—The type locality is San Andres de Machaca, south of Lake Titicaca in the Department of La Paz, Bolivia. The present specimens were collected about 20 to 30 miles northwest of San Andres. These appear to be the first specimens recorded since the original description.

***Ctenomys opimus nigriceps* Thomas**

Ctenomys opimus Thomas, Ann. Mag. Nat. Hist., (6), 20, p. 550, 1897—Puno, Peru.

Ctenomys opimus nigriceps Thomas, Ann. Mag. Nat. Hist., (7), 6, p. 383, Oct. 1900.

Type locality.—Tetiri, Puno, Peru. Thomas gives the locality as "about 40 miles W. of Puno, on the Puno-Moquegua road, altitude 16,000 feet." Moquegua is southwest of Puno.

Specimens examined.—Peru: Puno; Caccachara, S.W. of Ilave, 16,000 ft. 3 females (M.C.Z.).

The specimens from Puno agree almost perfectly with Thomas' description and are close enough within the region of the type locality to be considered topotypes. Compared with a series of *Ctenomys* from Mt. Sahama, Bolivia, which Thomas considered typical of *C. opimus* the most noticeable difference aside from the darker general color, is the deeper black on the head, face and throat in *nigriceps*. The sides of the muzzle and chin are not black in *opimus*. A specimen from Choquelimpie, Prov. Tacna, Chile, 15,000 ft., while dark enough to be considered *nigriceps* lacks the black chin and muzzle and was referred to *opimus* by Osgood.

Measurements.—Total length 252, 269, 270; tail 80, 81, 84; hind foot 35, 36, 37; ear 7, 7, 8. Skull: greatest length 46.2, 47.4, 47.5; condylo-basal length 44.1, 44.3, 44.5; zygomatic width 28.2, 28.3, 29.6; inter-meatal width 28.9, 28.9, 29.2; interorbital width 9.5, 10.1, 10.3; breadth of brain case 18.2, 18.5, 18.6; length of nasals 16.1, 16.5; upper tooth row 10.0, 10.4, 10.5.

Remarks.—Judging from sight records the ranges of *C. o. nigriceps* and *C. peruanus* overlap near Santa Rosa. *C. o. nigriceps* did not call when underground, the usual custom of *Ctenomys*.

Association of *Ctenomys* and *Galea*

The Peruvian Zoological Expedition 1941-42 made a special trip to the southern part of the Department of Puno to collect topotypes of the guinea pig, *Galea musteloides* Meyen. These were first found in large numbers where the road crossed the Rio Ccallacami, near Hucallani and again in the broad river valley close to the town of Pisacoma. Near Huacullani they were living in burrows made by *Ctenomys leucodon* and at Pisacoma in the burrows of *Ctenomys peruanus*.

There were many *Galea* but few *Ctenomys* in the Huacullani colony and the *Galea* were very tame and could be approached closely. At Pisacoma *Ctenomys peruanus* greatly outnumbered the *Galea*, which were wary and difficult to approach. When the colony was visited the many *Ctenomys* gave their alarm call and the *Galea* took cover on hearing it. So *Galea* not only used *Ctenomys* as a home builder but also reacted to its alarm calls in time of danger. The association was also noted by Pearson at Mazocruz and Huari Huarani.

The Aymara name "tocoro" is used in southern Peru for *Ctenomys* instead of tuco-tuco, the common name in Argentina and Chile.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTHE STATUS OF THE MILLIPED *LASIOLOATHUS*
VIRGINICUS, WITH NOTES ON *SCYTONOTUS*
GRANULATUS

By RICHARD L. HOFFMAN

In 1943 (Journ. Wash. Acad. Sci., 33(10): 318-320) Mr. H. F. Loomis described *Lasiolathus virginicus* as a new genus and species of milliped. Although mature specimens were lacking, he felt that certain characters shown by 7th instar larvae justified the proposal of the new names. The type locality for *L. virginicus* is the vicinity of Panorama, at Thornton Gap, in the Blue Ridge, Page-Rappahannock counties, Virginia. In addition to many type specimens, Loomis also had material from Jonesville, Washington County, Tennessee. The only other reference to this form is also by Loomis (1944, Psyche, 51: 175); he mentioned immature specimens taken at Crittenden, Grant County, Kentucky, by Dr. V. E. Shelford. Thus, the species has been recorded from three localities in as many states, and mature specimens have never been collected.

I became interested in the *Lasiolathus* problem in 1947, when it became apparent that *L. virginicus* was one of the most abundant invertebrates in the vicinity of Clifton Forge, Alleghany County, Virginia. In shale regions, particularly, the form was extremely common; and I frequently discovered as many as fifty to a hundred on one log. These animals agreed well with Loomis's description and figure, and later I sent specimens to the describer for further confirmation of identity.

Investigation was stimulated by the fact that during the winter months I was able to secure rather large numbers *Scytonotus granulatus*, while that species was apparently replaced during the summer by "*Lasiolathus*." I obtained a large number of the latter at Clifton Forge and kept them in humus until the final moult (which began on October 13) was undergone.

The diagnostic characters for the genus and species stated by Loomis were degree of dorsal tuberculation, serration of the edges of the keels, setiferous condition of the tergites, and forward production of the keels of the second body segment. In the transformed males which I obtained, all of these characters lose their distinctness. The tubercules are lower and serrations of the keels become less pronounced. Finally, the male gonopods, which in the final analysis provide the most reliable

character, match perfectly with the figures of those of *Scytonotus granulatus* given by Cook and Cook (1895, Ann. N. Y. Acad. Sci., 9, Pl. IV, Fig. 8) and by Williams and Hefner (1928, Bull. Ohio Biol. Surv., 4 (3): 111, fig. 12B).

It is apparent, therefore, that *Lasiolathus virginicus* Loomis 1943, becomes a synonym of *Scytonotus granulatus* (Say) 1821.

S. granulatus has been reported from the following states: New York, Pennsylvania, District of Columbia, and Virginia (Cook and Cook, *op. cit.* p. 241); Indiana and Minnesota (Bollman, 1893, Bull. U. S. Nat. Mus., 46: 108, 184); North Carolina (Chamberlin, 1940, Canadian Entom., 72: 56); and from Tennessee and Kentucky (Loomis, *op. cit.*)—as *Lasiolathus*. I have records for West Virginia, thus the species is known to have a wide range over northeastern United States. For Virginia, I have distributional records, which may be of interest, as follows:

Alleghany County: Clifton Forge and vicinity; *Augusta County*: near Deerfield; *Bath County*: 7.2 miles SW of Millboro Springs; *Botetourt County*: 1.3 miles NW of Eagle Rock; *Montgomery County*: Elliston; *Fairfax County*: Great Falls; *Page County*: Thornton Gap; *Surry County*: Swan's Point Plantation, near Scotland.

At Clifton Forge, where I am familiar with the habits of *granulatus*, it can be found in many sorts of habitats except very damp ones. It is the characteristic milliped of shale regions, being particularly common in deep ravines on shale mountains. During the night and morning, individuals are out in great numbers on the sides and ends of decaying logs. The species seems to congregate in groups for hibernation.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW OWLS, A SWIFT AND A POORWILL FROM
MEXICO¹

By ROBERT T. MOORE

Since the description by Griscom (Amer. Mus. Nov. No. 438, Dec. 15, 1930) of *Cryptoglaux rostrata* from Guatemala, the number of specimens of the Saw Whet Owl recorded from Mexico has been doubled by the securing of four individuals for the Moore collection and the locating of a fifth in the Museo Nacional de Historia Natural in Mexico City, a bird in immature plumage. The tag on the last records its capture at Jalapa, Veracruz. The ones in the Moore collection consist of the following: an adult male from Rancho Enmedio, Guanajuato, 6,000 feet altitude, Jan. 18, 1939 with sex organs considerably enlarged; an adult female from Puerto Lengua de Vaca 47 miles west of Toluca, State of Mexico, 9,350 feet altitude, Oct. 28, 1941; a male, in typical immature plumage with sex organs greatly enlarged, from a garden in Mexico City, Feb. 19, 1942; and a peculiar male from Volcán Tacaná, Chiapas, 3,000 meters altitude, April 14, 1943, with sex organs somewhat enlarged. Although the two adults show a slight buffiness on the flanks, this may be a remnant of the immature plumage and they are deemed to be true *acadicus acadicus*, as are the first and fourth bird mentioned above. The same is true of the Los Masos, Jalisco, individual in the American Museum of Natural History.

The Chiapas specimen is obviously a different form, intermediate, except for one character, between *acadicus* of the United States and the tropical *rostratus* of Guatemala. It is herewith described:

***Aegolius ridgwayi tacanensis*, subsp. nov.**

Tacaná Saw Whet Owl

Type.—Male, number 37459, collection of Robert T. Moore; Volcán Tacaná, Chiapas, Mexico; altitude 3000 meters; April 14, 1943; sex organs slightly enlarged; collected by Mario del Toro Avilés.

¹A contribution from the California Institute of Technology, Pasadena, California.

Subspecific characters.—Nearest in its most important characters to *Aegolius ridgwayi rostratus* Griscom and, like it, differing from true *acadicus* in having (1) the toes partly bare; (2) the wings and tail without white spots or bars or with only vestigial traces; (3) the suborbital region browner; and (4) the under wing coverts not white, it also differs from *rostratus* in having (A) a more pointed wing; (B) a smaller bill and shorter culmen; (C) buff rather than wood-brown under wing coverts; and (D) very short buffy streaks on forehead, instead of none in *rostratus*, or long white ones in *acadicus*. In addition, the brown and white streaks on the ruff of *acadicus* are replaced by a conspicuous buffy band, each feather margined by brown, producing a marbled effect, the same being bordered anteriorly by white.

Range.—Known only from one specimen, the type, taken in the Temperature Zone at an altitude of about 10,000 ft. on the Mexican side of the boundary with Guatemala.

Measurements in millimeters.—Wing 136.2, Tail 59, Culmen from cere 12.4.

Specimens examined.—*acadicus*: 73 specs. from Canada and the United States, all in the Museum of Comparative Zoology; these include 6 immatures, also 2 immatures marked "*brooksi*." In addition the 5 specimens from Mexico, mentioned above, and 4 from the U. S. in the Moore Collection; also the 1 in the Museo Nacional of Mexico City. Finally all specimens in the American Museum of Natural History, the Biological Survey Collection and the United States National Museum, including the type of *ridgwayi*. I have not inspected the type of *rostratus*, but Griscom, the describer, who has inspected the type of *tacanensis*, assures me the latter is distinctly different in the characters given.

Remarks.—From the above I do not jump to the conclusion that *acadicus*, *tacanensis*, *rostratus* and *ridgwayi* are all conspecific, although this may be true, because I feel, as Peters (Birds of the World, 4, 174, footnote 1) has expressed it, that until it is definitely known that all have an adult plumage, it is wiser to maintain two specific entities. The discovery of a high temperature form of the *acadicus*—*ridgwayi* group as far south as the Guatemalan border does not militate against Griscom's theory that the tropical forms of this group may not have an adult plumage. *Tacanensis* is not a tropical form. On the other hand, if this peculiar plumage of the type proves to be its adult plumage and that it has an as yet undiscovered immature plumage, then such evidence, coupled with the intermediate characters of this type may force the conclusion that it is the hitherto missing link between the temperate *acadicus* and the tropical *rostratus*.

The reasons for conceiving that the plumage of the type of *tacanensis* may be nearly adult are as follows: the upper parts are not the dark Vandyke Brown² that immatures of *acadicus* show, but the lighter Prouts Brown of the adults; the sides of the face and anterior underparts also resemble an adult plumage as do the whitish legs, toes and under tail coverts. Only the buffy posterior underparts can be regarded as evidence of immaturity. The fact that the median rectrices are still in their sheaths in an April bird seems to indicate this individual was

²Names of colors, when capitalized, are taken from Ridgway's Color Standard and Nomenclature, 1912.

born in the previous year, for often late fall specimens of *acadicus* possess typical immature plumage throughout, as this bird does not.

My thanks are gratefully offered to the authorities of the American Museum of Natural History and the Biological Survey, and particularly to Ludlow Griscom of the Museum of Comparative Zoology and to Herbert Friedmann of the United States National Museum for unusual courtesies.

In June of 1945, on my return from a zoological trip to Chiapas, I happened to visit a small taxidermical shop in Mexico City at the invitation of Senor Abraham Ramirez, who had collected for me on an expedition to Presidio, Veracruz in 1942. Almost hidden on a top shelf a peculiar bird with swallow-like tail and white throat caught my attention. As I previously had never seen one like it, I purchased it and obtained minute details of its capture in Presidio by Senor Ramirez. It proved to represent an extraordinary extension of range of a genus, not hitherto recorded from Mexico. I herewith describe it as a new subspecies:

***Panyptila cayennensis veraecrucis* subsp. nov.**

Veracruz Panyptila

Type.—Male adult, number 45544, collection of Robert T. Moore; Presido, Veracruz, Mexico; about 500 ft. altitude; June 1943; collected by Abraham Ramirez.

Subspecific characters.—Nearest to *Panyptila cayennensis cayennensis* (Gmelin) of Central America, but differs in having both wing and tail about 10% larger. It differs much more from its geographically nearer relative, *Panyptila sancti-hieronymi* Salvin, of Guatemala, which although almost identical in coloration, is a huge bird relatively, almost twice its size.

Range.—Known only from the type, taken in the Tropical Zone of Veracruz at Persidio.

Measurements in millimeters.—male type—Wing 126.8, Tail 63., Exposed Culmen 4.6. Average measurements of 9 *cayennensis* males from Nicaragua, Panama and Trinidad—W. 117.1, T. 55.8.

Specimens examined.—*cayennensis*: 6 males and 10 females from Canal Zone, Panama, in M.C.Z.; 1 spec. from Trinidad and 4 from S. America in Am. Mus. of N. H.; 1 spec. from Trinidad and 4 from Rio Escondido, Nicaragua, in U. S. Nat. Mus.; 1 spec. from Catacamas, Honduras; *sancti-hieronymi*: 1 spec. from Guatemala in U. S. Nat. Mus.; *veraecrucis*: the Type.

Remarks.—Previous to the discovery of *veraecrucis* in Mexico, the most northern point from which this species had been recorded was Catacamas, Honduras. Apparently from that locality south through Central America it is nowhere common, except locally at its nesting sites, but it has been collected at various localities in South America and about the locks of the Panama Canal Zone it has been almost common at times, it having been found breeding there on July 23, 1932 by J. Greenway, Jr. The great extension of the range of the species northward by the present discovery reveals a surprisingly irregular

distribution, for it never has been taken in the vast area between Honduras and Veracruz, and yet its huge relative, *sancti-hieronymi*, nearly twice its size and almost identical in coloration, is found in this very gap, apparently the lone representative of the genus in Guatemala, where it seems to be extremely rare, if its infrequent capture is any criterion. Because of the enormous disparity in size of this last species it seems best to follow the custom of the past and not treat it as conspecific with *cayennensis*, but if this is the correct disposition of it, we should expect someday to find a race of *cayennensis* in Guatemala.

One of the surprising discoveries by Mario del Toro Avilés has been two specimens related to *Glaucidium m. rarum* of Panama. It is here-with described:

***Glaucidium minutissimum occultum* subsp. nov.**

Oaxaca Pygmy Owl

Type.—Female adult in intermediate phase, number 33803, collection of Robert T. Moore; Moctum (Mt. Zempoaltepec), Oaxaca, Mexico; September 10, 1941; collected by Mario del Toro Avilés.

Subspecific characters.—Nearest to the intermediate phase of *Glaucidium minutissimum rarum* Griscom of Panama but differs in having (1) white dots on pileum smaller and much less frequent; (2) nuchal band with more extensive black and white, extending completely across the nape; (3) white band from chin extending posteriorly below the sub-orbital area to the nuchal band—more prominent; (4) legs white to buff, instead of cinnamon. It differs from *G. m. griseiceps* in same characters, but to greater degree; differs from intermediate phases of *palmarum* and *oberholseri* in characters (1) and (2) above; in addition (A) it has only three tail-bars instead of four and the tail is shorter; (B) is much darker throughout; and (C) the streaking below is heavier. No comparable phase of *griscomi* has been collected, but since its gray phase is paler and grayer than either *palmarum* or *oberholseri*, it may be deduced that it will prove to be paler and not darker like *occultum*; tail shorter.

Range.—From Moctum on Mt. Zempoaltepec, Oaxaca, Mexico south to Palenque, Chiapas.

Specimens examined.—*rarum*: the type and one other male from Panama; also one male from Costa Rica—all three in the Mus. of Comp. Zoology; *occultum*: 1 ♀ (type) and 1 ♂ in Moore Col. from Moctum, Oaxaca and Palenque, Chiapas respectively; *griseiceps*: 3 specs. in the M. C. Z. from Honduras in the gray phase with four tail bars and two in the intermediate phase with three tail bars, all marked *griseiceps*; *griscomi*: 5 specs. in Moore Col. from two localities, one in Morelos and the other on the Rio Balsas in extreme northern Guerrero; also 2 specs. in the M. C. Z. from Omilteme and Chilpancingo in southern Guerrero, marked *palmarum*, but which are closer to the grayer *griscomi*; *palmarum*: the Type in the U. S. Nat. Mus. from Nayarit, also 4 specs. in Moore Col. from Nayarit and 3 intergrades between *palmarum* and *oberholseri* from

extreme southern Sinaloa. In addition I have inspected the large series of *gnoma* in the Moore Col. from various parts of Mexico and many others in American museums; also 5 specs. of *oberholseri* in Moore Col.

Remarks.—*Occultum* is known only from the adult female type from eastern Oaxaca and the adult male from Palenque on the Atlantic slope of Chiapas, both localities more humid than the Arid Tropical habitat along the Rio Balsas of its geographically nearest relative, *griscomi*.

These two individuals are almost identical in coloration and both in the intermediate phase. They belong to the southern of the two groups, into which *Glaucidium minutissimum* is divided by criteria, which a decade ago would have excluded them from being deemed conspecific. The southern group (*minutissimum*, *rarum*, *griseiceps* and *occultum*) ranging from South America through Panama to Oaxaca have (1) proportionately shorter tails; (2) tail-bars 3 in the intermediate phase of *rarum*, *griseiceps* and *occultum*, 4 in the gray phase of *griseiceps* and 4 or 5 in the South American *minutissimum*; (3) intermediate and rufescent phases predominating. The northern group (*griscomi*, *palmarum* and *oberholseri*) ranging from western Morelos and central Guerrero to Sinaloa have (1) proportionately longer tails; (2) tail-bars never 3, but 4 in both intermediate and gray phases (5 in type and one other *palmarum*); (3) rufescent phase lacking, while the gray phase predominates over the intermediate in the ratio of 5 to 1. It must be remembered it is customary in this genus, when counting tail-bars, to eliminate the one on the tip (generally worn away) and the vestigial one at the extreme base of the rectrices. The number of tail-bars is not a phase character, because 19 individuals of the northern group in both gray and intermediate phases possess 4 tail-bars.

Average Measurements in Millimeters of Males

	<i>Wing</i>	<i>Tail</i>
4 <i>oberholseri</i>	81.1 (80.5-82)	50.6 (48.6-53.1)
6 <i>palmarum</i>	81.9 (80.-84.1)	53.6 (52.3-55.9)
5 <i>griscomi</i>	85.6 (84.2-88.1)	56.2 (54.1-57.5)
1 <i>occultum</i>	85.9	49.8
1 <i>griseiceps</i>	84.2	43.6
3 <i>rarum</i>	98.7 (86.9-92.)	48. (46.-51.2)

From the Central Plateau we have received 8 specimens of *Phalaenoptilus nuttallii*. Two females from Rancho Orozco, 8 miles south of Cuatro Ciénegas, Coahuila (Nov. 14) and one December female from Chareo Redondo, Jalisco, are typical migrants of the so-called hoary phase of the nominate race, formerly known as *nitidus*. But five breeding birds from the central portion of the great Plateau (one a parent male taken with a young bird just out of the nest, another a female containing large eggs, and the rest with sex organs much enlarged) represent a new race—the darkest race yet discovered, remarkably contrasted with the hoary phase *nitidus* and even darker than true *nuttallii*. It is herewith described:

***Phalaenoptilus nuttallii centralis* subsp. nov.**

Central Plateau Poorwill

Type.—Adult male, parent of young bird just out of nest, number 23428, collection of Robert T. Moore; Puerta de Guadalupe, 5 miles west of Ibarra, Guanajuato, Mexico; altitude about 7200 ft.; collected by Chester C. Lamb.

Subspecific characters.—Nearest to *Phalaenoptilus nuttallii californicus*, but (1) back darker brown (not reddish as in *adustus* of Arizona); (2) hastate black marks of tertials smaller; (3) brown bars on the black breast much thicker; (4) abdomen paler. Compared with true *nuttallii* of Colorado it is darker than even the dark phase; compared with *adustus* of Arizona it is obviously less reddish in the brown of the back; compared with *dickeyi* of Baja California it is conspicuously darker and still more so than the exceedingly pale *hueyi* of the Colorado River delta.

Range.—Ranges at least from Charco Redondo, Jalisco, in the south, northeast to Puerta de Guadalupe, Guanajuato and north to Nombre de Dios and Rio Mezquitál 12 miles northeast of Durango City, the two last collecting stations being in the state of Durango.

Measurements.—These do not show any trenchment differences from *californicus*, but are larger than those given for *dickeyi* by its describer.

Specimens examined.—*centralis*: five specimens all in the Moore collection: Durango—Rio Mezquitál 2 males; Nombre de Dios 1 male; Guanajuato—Puerta de Guadalupe 1 male (Type); Jalisco—Charco Redondo, 20 miles west of Ojuelos 1 female. All five were collected between the dates, May 13 and June 1. Also all the specimens of related races in the United States National Museum and the Museum of Comparative Zoology, where there are very large series of true *nuttallii* (also the so-called hoary phase, *nitidus*), *adustus* and *californicus*. In the latter museum are 4 specimens of *hueyi* and five of *dickeyi*.

Remarks.—The discovery of *centralis* extends the breeding range of *nuttallii* several hundred miles farther south than had been hitherto known. It is interesting that it is so much darker than any of the races geographically nearest to it.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TEN NEW SUBSPECIES OF BIRDS FROM
VENEZUELA

By WILLIAM H. PHELPS AND WILLIAM H. PHELPS, JR.

The senior author wishes to thank Dr. John T. Zimmer of the American Museum of Natural History, Dr. Herbert Friedmann of the United States National Museum, Mr. Rodolphe Meyer de Schauensee of the Academy of Natural Sciences of Philadelphia and Mr. Emmet R. Blake of the Chicago Natural History Museum for their help in the examination of material in their museums.

The apparently new subspecies here described are in the Phelps Collection, Caracas, and unless otherwise specified, the specimens listed as examined are in the same collection.

Names of colors are capitalized when direct comparison has been made with Ridgway's "Color Standards and Color Nomenclature."

Malacoptila fusca venezuelae, new subspecies

Type: From Cerro Yacapana, Río Orinoco, Territorio Amazonas, Venezuela; altitude 110 meters. No. 39085, Phelps Collection, Caracas. Adult male collected May 19, 1947, by Manuel Castro. (Type on deposit at the American Museum of Natural History.)

Diagnosis: The back is darker, blacker, less brownish, than *M. f. fusca*.

Range: Known only from Cerro Yacapana and from Campamento La Cruz on the Yavita-Pimichín portage.

Description of Type: Top of head and nape black, the feathers with narrow whitish shaft streaks, more buffy on forehead; back and uropygium dusky brown, the feathers with wide buffy shaft streaks; lores whitish; nasal and loreal bristles black; sides of head black; ear-coverts and gular region with buffy white shaft streaks; a whitish superciliary streak. Chin and sides of throat blackish brown striped with buffy; throat white; breast and sides blackish brown broadly striped with buffy, much paler on abdomen, merging to pale buffy white on vent and under tail-coverts. Remiges dark Sepia very narrowly edged with buffy, the tertials paler with narrow pale apical shaft streaks; inner edges of remiges narrowly and basally edged with Pale Ochraceous-Buff; upper wing-coverts and axillaries buffy with a streak of dark

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brown. Tail dark Sepia, paler on under surface; shafts of rectrices dark brown above, buffy below.

Bill (in life) "black and fiery yellow"; feet "grayish yellow"; iris "chestnut." Wing, 85 mm.; tail, 61; exposed culmen, 25, culmen from base, 31; tarsus, 19.

Remarks: Sexes alike. Range of measurements: three adult males—wing, 85 mm.; tail, 59-62 (60.7); culmen from base, (2), 30, 31 (30.5). One adult female—wing, 89; tail, 62; culmen from base, 32.

These specimens extend the range of the species from Brazil, the Guianas, Colombia, Ecuador and Perú.

Specimens Examined

M. f. fusca.¹—BRAZIL: Isla Cayari, Ussa Swamp, 1 ♂. FRENCH GUIANA: Approuage, 1 ♂. BRITISH GUIANA: "British Guiana," 1 (?); "Demerara," 1 (?). COLOMBIA: La Morelia, 1 ♂, 1 ♀; Huila, 1 ♀; "Bogotá," 5 (?). ECUADOR: San José de Sumarco, 1 ♀; "Ecuador oriental," 1 ♀; "Ecuador," 1 (?). PERU: Chuchunar, 2 ♀; "Napo," 1 (?); Boca Río Curaray, 2 ♂, 1 ♀.

M. f. venezuelae.—VENEZUELA: Cerro Yapacana, 2 ♂ (incl. type); Campamento La Cruz, Yavita-Pimichín, 1 ♂, 1 ♀.

Synallaxis cabanisi yavii, new subspecies

Type: From Cerro Yaví, Territoria Amazonas, Venezuela; altitude 1900 meters. No. 37699, Phelps Collection, Caracas. Adult female collected February 26, 1947, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *S. c. cabanisi* of Perú but breast, sides and abdomen paler, more yellowish olive, less brownish; throat duller with the whitish barring less prominent; back darker, browner, with less rufous tinge. It is very different from the two Venezuelan subspecies, *macconelli* of Cerro Roraima and *griseipectus* of Cerro Ptari-tepui, as it is much lighter below, pale olive instead of dark gray.

Range: Only known from the type from Cerro Yaví.

Description of Type: Top of head and nape Sanford's Brown, feathers of crown and forehead with dusky centers; back and uropygium Prout's Brown; lores grayish; ear-coverts grayish olive. Chin and throat grayish, finely barred with whitish; breast, sides, flanks, shanks and under tail-coverts Light Brownish Olive, center of abdomen paler. Wings Fuscous; inner edges of remiges basally, more extensively towards tertials, Light Ochraceous-Salmon; outer edges of remiges, except tips and outer vanes of upper wing-coverts, Burnt Sienna; bend of wing, under wing-coverts and axillaries Orange-Buff. Tail Auburn, paler below; upper surface of shafts black, lower yellowish brown.

Bill (in life) "black, base of lower mandible white"; feet "olive"; iris "chestnut." Wing, 59 mm.; tail, 73; exposed culmen, 13; culmen from base, 17; tarsus, 22.

Remarks: It is notable that this new subspecies should be so different from those of the mountains of the Gran Sabana and that it should be closer to the distant one in Perú. As far as we know, each one of the three Venezuelan subspecies of *cabanisi* is confined to the

¹Specimens in the American Museum of Natural History.

mountain from which it was described: *macconnelli*, Roraima; *griseipectus*, Ptari-tepui; *yavii*, Yaví.

Specimens Examined

S. c. cabanisi.—PERU:¹ Tulumayo, 2 ♂, 2 ♀, 1 (?); La Pampo, 1 ♂; Lagarto, Alto Ucayali, 3 ♂, 2 ♀.

S. c. flaviventris.—BOLIVIA:¹ Todos Santos, Río Chaparé, 1 ♂, 1 ♀.

S. c. macconnelli.—VENEZUELA: Arabupú, 3 ♂; Mt. Roraima,¹ 5 ♂, 2 ♀.

S. c. griseipectus.—VENEZUELA: Cerro Ptari-tepui, 4 ♂, 3 ♀.

S. c. yavii.—VENEZUELA: Cerro Yaví, 1 ♀ (type).

Automolus roraimae paraquensis, new subspecies

Type: From Cerro Paraque, Territorio Amazonas, Venezuela; altitude 1450 meters. No. 33510, Phelps Collection, Caracas. Adult male collected February 16, 1946, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *A. r. roraimae*, from Mt. Roraima and other mountains of the Gran Sabana, in a paler back, more yellowish brown, less rufous brown. Differs from *A. r. duidae*, from Mt. Duida, additionally by a paler breast and abdomen, more grayish olive, less ochraceous olive.

Range: Known only from the western slopes of Mt. Paraque in the Subtropical Zone, at altitudes from 1450 to 1600 meters.

Description of Type: Top of head Brussels Brown; back Cinnamon-Brown, more rufous on rump; upper tail-coverts Burnt Sienna X Chestnut; lores pale buffy; superciliary stripe white; ear-coverts Raw Umber. Chin and throat white; breast Buckthorn Brown merging into Dresden Brown on sides, flanks and lower abdomen; under tail-coverts Tawny. Inner webs of primaries and secondaries Fuscous, outer webs uniform with back, the outermost with progressively more dusky inner webs; wing-coverts uniform with back with more or less dusky inner vanes especially the primary coverts; under surface of inner vanes of remiges edged basally with Salmon-Buff, progressively more extensive inwards; under wing-coverts and axillaries pale Ochraceous-Orange. Upper surface of tail darker than Burnt Sienna, lower surface paler. Bill (in life) "black, flesh base"; feet "greenish gray"; iris "brown." Wing, 78 mm.; tail, 77; exposed culmen, 18; culmen from base, 21; tarsus, 21.

Remarks: Range of measurements: three adult males—wing, 78-80 (78.7) mm.; tail, 75-77 (75.7); culmen from base, 21-21 (21). One adult of undetermined sex—wing, 78; tail, 74; culmen from base, 21.

One of the specimens is immature. It has the superciliary stripe ochraceous instead of white, and ochraceous feathers on the lower throat and anterior breast.

Specimens Examined

A. r. roraimae.—VENEZUELA: Cerro Roraima, 1 ♀; Cerro Ptari-tepui, 10 ♂, 2 ♀, 3 (?), 1 ♂ juv.; Cerro Sororopán-tepui, 1 ♂, 2 ♀; Cerro Chimantá-tepui, 6 ♂, 3 ♀, 1 (?); Cerro Uaipán-tepui, 2 ♀; "Roraima,"¹ 1 ♂, 1 (?); Rondón Camp, Roraima,¹ 1 ♂; Cerro Auyan-tepui, (1850-2200 m.),¹ 3 ♂, 4 ♀, 1 (?).

A. r. duidae.—VENEZUELA: Cerro Duida, 1 ♂; Cerro Duida (1400-2000 m.),¹ 6 ♂, 8 ♀, 2 ♀ juv.; Cerro Yaví, 2 ♂, 2 ♀, 1 (?), 2 (?) juv.; 1 (?) imm.

A. r. paraquensis.—VENEZUELA: Cerro Paraque, 3 ♂ (incl. type), 1 (?), 1 (?) juv.

***Lochmias nematura chimantae*, new subspecies**

Type: From Cerro Chimantá-tepui, Gran Sabana, Bolívar; altitude 1850 meters. No. 35718, Phelps Collection, Caracas. Adult female collected July 12, 1946, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

DIAGNOSIS: Nearest to *L. n. castanonota* of Mts. Kukenam and Roraima but above it is paler, more yellowish, less dark brown; the crown is paler, more olivaceous, less dusky. From *L. n. nematura* of southern Brazil it differs in a darker back, more brownish, less yellowish.

Range: Known only from Mts. Chimantá-tepui, Sororopán-tepui and Auyan-tepui at altitudes from 1400 to 1850 meters.

Description of Type: Crown Mummy Brown with faint dusky edges to feathers giving a scalloped appearance, merging into the grayish forehead; back and rump Auburn; upper tail-coverts dusky; lores slightly grayish; superciliary stripe white, extending through neck; ear-coverts Auburn, the shafts whitish. Chin white; rest of under parts Mummy Brown heavily spotted with white, more sparsely on sides and flanks; under tail-coverts dusky with white shaft streaks. Wings Sepia; primaries finely edged with grayish; tertials and upper wing-coverts heavily edged with Auburn, uniform with back; under wing-coverts and axillaries dusky, tipped with white; bend of wing brownish, the feathers tipped with white. Tail Fuscous-Black above, Bone Brown below.

Bill (in life) "black, base flesh"; feet "brown"; iris "brown." Wing, 64 mm.; tail, 42; exposed culmen, 22; culmen from base, 23; tarsus, 22.

Remarks: Sexes alike. Range of measurements: three adult males—wing, 66-68 (67.3) mm.; tail, 39-45 (42.3); culmen from base, (2), 24. Three adult females—wing, 64; tail, 42-43 (42.3); culmen from base, 22-23 (22.3). One adult male of *castanonota*—wing, 71; tail, 46; culmen from base, 24. One adult female of *sororia*—wing, 70; tail, 45; culmen from base, 23.

According to Chubb² *castanonota* was known by only one specimen, the type, in the British Museum, collected on Mt. Kukenam, Venezuela. This mountain is in immediate proximity to Mt. Roraima and connected with it at the lower levels. Our specimen from Mt. Roraima, the second in the world apparently, we will consider topotypical for the purpose of comparison with the new subspecies we are describing, inasmuch as there has been no opportunity of examining the type.

Our specimen from Mt. Sororopán-tepui, although we are calling it for the moment *chimantae*, has a redder back and it is darker below. It is possible that still another subspecies inhabits this mountain and the adjacent Ptari-tepui.

²Birds of British Guiana, II, p.89, 1921.

Specimens Examined

L. n. nematura.—BRASIL:¹ Victoria, 1 ♂; San Sebastiao, 1 ♂, 1 ♀; Chapada, 6 ♂, 2 ♀, 3 (?); Monte Serrat, 2 ♀; Macieiras, 1 ♀; Alambary, 1 ♂; "Goyaz," 1 ♂; Roca Nueva, 1 ♀; Castro, Parana, 1 ♂.

L. n. castanonota.—VENEZUELA: Cerro Roraima (south west slope, 2200 m.), 1 ♂.

L. n. chimantae.—VENEZUELA: Cerro Chimantá-tepui (1850 m.), 2 ♀ (incl. type); Cerro Sororopán-tepui (1400 m.), 1 ♀; Cerro Auyan-tepui (1850 m.), 1 ♂, 2 ♂, 1 ♀.¹

L. n. sororia.—VENEZUELA: Bucaral, 1 ♀. COLOMBIA:¹ Los Tambos, 1 ♀. ECUADOR:¹ San José Abajo, 1 ♂, 1 ♀; Río Suna, arriba de Avila, 1 ♀.

Thamnophilus insignis nigrofrontalis, new subspecies

Type: From Cerro Paraque, Territorio Amazonas, Venezuela; altitude 1600 meters. No. 33572, Phelps Collection, Caracas. Adult female collected February 15, 1946, by Kathleen D. Phelps. (Type on deposit at the American Museum of Natural History.)

Diagnosis: The female differs from that of *T. i. insignis* from Mts. Roraima, Ptari-tepui, Chimantá-tepui and Uaipán-tepui in having an immaculately black forehead instead of barred with gray. The males differ from those of Ptari-tepui and Chimantá-tepui in having an immaculate black forehead instead of faintly and finely streaked with gray.

Range: Known from Mts. Paraque, Duida and Auyan-tepui in the Subtropical Zone.

Description of Type: Forehead, fore-crown and lores black; rest of crown Bay; nape and sides of posterior crown black, heavily banded with white; back and rump mixed black and grayish, the mantle heavily and visibly marked with white; upper tail-coverts black with broad white tips; sides of head mixed dusky and grayish. Underparts Deep Gull Gray, paler on abdomen, finely mottled with dusky on throat. Wings black turning to Fuscous on primaries; remiges very faintly edged medially and externally with white and the tertials strongly edged and tipped with white; inner edge of remiges basally and medially white; greater and coverts strongly tipped with white; scapulars broadly edged with white; bend of wing mixed black and whitish; under wing-coverts and axillaries grayish. Tail black, rectrices broadly tipped with white, the outer ones with a prominent median spot on the outer vane. Bill (in life) "black"; feet "slate"; iris "brown." Wing, 75 mm.; tail, 67; exposed culmen, 17; culmen from base, 21; tarsus, 21.

Remarks: Sexes dissimilar in color but alike in size. Range of measurements: five adult males (topotypical)—wing, 74-78 (76.2) mm.; tail, 67-71 (69.2); culmen from base, 21-22 (21.8). Four adult females (topotypical, including type)—wing, 75-77 (75.5); tail, 67-71 (69); culmen from base, 21-22 (21.5). *T. i. insignis* (from Ptari-tepui), five adult males—wing, 73-76 (74.6); tail, 65-70 (66.8); culmen from base, 21-22 (21.6). The measurements of the topotypical female from Mt. Roraima, in the American Museum of Natural History, are: wing, 71; tail, 61; exposed culmen, 16; culmen from base, 20; tarsus, 22. These measurements are smaller than those of topotypical *T. i. nigrofrontalis*

and it would be of interest to know the measurements of the specimens in the British Museum.

The male differs from the female in having a black crown instead of bay.

The specimens from Mt. Duida are not typical inasmuch as only half of them have immaculately black foreheads but they are nearest to *nigrofrontalis*.

As far as we know there are seven topotypical specimens of *insignis* from Mt. Roraima: in the British Museum, 2 ♂, 2 ♀ (collected by Whitely, including the types) and (at least) 1 ♂ and 1 ♀ in the McConnell Collection, and in the American Museum of Natural History, 1 ♀ collected by Whitely. Inasmuch as the female in the American Museum is similar to our series from Ptari-tepui, we presume that both females and males in London are also similar, but we do not know this and a direct comparison would be advisable.

When Dr. Chapman³ identified the large series from Mt. Duida, presumably he only had for comparison this same female from Mt. Roraima. He noted that the Roraima specimen was smaller. We are not using size in our diagnosis of the new form as we do not know the measurements of the six topotypical skins in London.

Specimens Examined

T. i. insignis.—VENEZUELA: Cerro Roraima,¹ 1 ♀; Cerro Ptari-tepui, 7 ♂, 2 ♂ juv., 6 ♀; Cerro Chimantá-tepui, 6 ♂, 4 ♀; Cerro Uaipán-tepui, 1 ♀.

T. i. nigrofrontalis.—VENEZUELA: Cerro Paraque (900-1600 m.), 9 ♂, 1 ♂ juv., 4 ♀ (incl. type); Cerro Duida (1400-2000 m.),¹ 33 ♂, 33 ♀; Cerro Auyan-tepui¹ (1850-2200 m.), 3 ♂, 1 ♀.

Chamaeza brevicauda yavii, new subspecies

Type: From Cerro Yaví, Territorio Amazonas, Venezuela; altitude 1600 meters. No. 37704, Phelps Collection, Caracas. Adult male collected February 26, 1947, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *C. b. obscura* from the Cerros Ptari-tepui, Sororopán-tepui, Auyan-tepui and Guaiquinima but the back is lighter, more yellowish olive, less brownish olive. Differs from *fulvescens* of Mt. Roraima and British Guiana also in the lighter back and additionally by the dark markings of the breast and abdomen being blacker with less brownish tinge.

Range: Known only from Cerro Yaví at altitudes between 1600 and 1700 meters.

Description of Type: Crown Medal Bronze, centers of feathers dusky giving a mottled appearance, merging into blacker on forehead and to more yellowish on hind neck, forming an indistinct collar; back and uropygium Medal Bronze with very faint and narrow dusky tips to the feathers; lores buffy; superciliary streak, commencing at mid-orbital point, gular streak and sides of neck buff; sides of head Medal Bronze, ear-coverts more dusky. Chin pale buffy margined by black stripes; throat pale buffy finely freckled with dusky tips to the feathers and

³Bull. Am. Mus. Nat. Hist., LXIII, p. 84, 1931.

merging into the darker buff of breast; a bronze wash across the breast; abdomen white; lower breast, sides and flanks heavily streaked with blackish, more narrowly towards middle line of abdomen which is almost immaculate; shanks bronzy; under tail-coverts Capuchin Buff with inconspicuous dusky shaft streaks and edgings to the feathers. Wings Fuscous; exposed surfaces of tertials and upper wing-coverts uniform with back; under wing-coverts and axillaries white broadly tipped with dusky. Tail Medal Bronze uniform with back, with a sub-terminal band of black and tipped with whitish, paler on the under surface.

Bill (in life) "black, flesh base"; feet "brown"; iris "dark." Wing, 101 mm.; tail, 60; exposed culmen, 20; culmen from base, 26; tarsus, 37.

Remarks: Range of measurements: two adult males—wing, 101, 105 (103) mm.; tail, 60, 63 (61.5); culmen from base (1), 26. *C. b. fulvescens*—one adult male—wing, 100; tail, 61; culmen from base, 24. *C. b. obscura*—four adult males—wing, 97-100 (99); tail, 57-58 (57.3); culmen from base, 25-25.5 (25.2).

The species *brevicauda*, although present on the mountains of the Gran Sabana and Guaiquinima, has not been collected on either Duida or Paraque.

Specimens Examined

C. b. brevicauda.⁴—ARGENTINA: 4. BRAZIL: 8. PARAGUAY: 1.

C. b. olivacea.⁴—PERU: 1.

C. b. punctigula.⁴—ECUADOR: 7. PERU: 1.

C. b. columbiana.⁴—COLOMBIA: 4.

C. b. venezuelana.—VENEZUELA: Cerro El Cerrón, 6 ♂, 1 ♀; Bucaral, 1 ♂; Colonia Chirgua, 1 ♀; Taria, 1 ♂; Las Quigas, 1 ♀; Cumbre de Valencia,¹ 1 ♂; Hda. Santa Clara, 2 ♂, 1 ♀; San José de Los Caracas, 3 ♂; Cerro Golfo Triste, 1 ♂, 2 ♀; Cerro Negro, Miranda, 2 ♂.

C. b. fulvescens.—VENEZUELA: Arabupú, 1 ♂, 1 ♀. BRITISH GUIANA: Merumé Mts., 1 ♂.¹

C. b. obscura.—VENEZUELA: Cerro Auyan-tepui, 1 ♂,¹ 1 ♂; Cerro Ptari-tepui, 6 ♂, 5 ♀, 1 (?); Cerro Sororopán-tepui, 2 ♂, 1 ♀; Cerro Guaiquinima, 2 ♂, 1 ♀.

C. b. yavii.—VENEZUELA: Cerro Yaví, 2 ♂ (incl. type).

Gymnopathys rufigula pallidigula, new subspecies

Type: From Campamento La Cruz, Yavita-Pimichín Portage, Territorio Amazonas, Venezuela; altitude 150 meters. No. 34559, Phelps Collection, Caracas. Adult male collected March 16, 1946, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from the two known subspecies, *rufigula* from the Guianas and Brazil, and *pallida* from southern Venezuela, in having a whiter abdomen, buffy white instead of dusky buff; the breast is more brilliant ochraceous, less dusky, and the throat is paler. Differs from *pallida*, additionally, in having a darker back, less olivaceous.

Range: Known from the portage which connects Yavita (on an

⁴For localities see Zimmer and Phelps, Am. Mus. Nov., No. 1270, p.9, 1944. Specimens in American Museum of Natural History.

affluent of the Río Atabapo) with Pimichín on Río Guainía), and from the foot of Cerro Yapacana, in Territorio Amazonas.

Description of Type: Top of head, lores and ear-coverts Sanford's Brown X Auburn; back and uropygium Brussels Brown; large concealed white patch on upper back. Sides of throat Sanford's Brown; chin, center of throat and fore-breast Ochraceous-Buff X Ochraceous-Orange merging into the Pale Yellow-Orange of the lower breast and abdomen; sides, flanks and shanks pale Mummy Brown, under tail-coverts more buffy. Entire exposed surfaces of wings Brussels Brown uniform with back; inner vanes of remiges Fuscous; bend of wing Sanford's Brown; under wing-coverts and axillaries grayish. Tail Brussels Brown, uniform with back. Maxilla (in life) "black"; mandible "black and white"; feet "flesh"; iris "dark." Wing, 73 mm.; tail, 46; exposed culmen, 18; culmen from base, 21; tarsus, 25.

Remarks: The female differs from the male in having the concealed back patch Capuchin Orange instead of white. The juvenile female differs from the adult in having the posterior breast and abdomen almost pure white and the chin, throat and breast pale buff instead of ochraceous.

Range of measurements: Three adult males—wing, 73-74 (73.3) mm.; tail, 46-46 (46); culmen from base, 21-22 (21.7). One adult female—wing, 70; tail, 46; culmen from base, 20.

Specimens Examined

G. r. rufigula.—FRENCH GUIANA¹: Tamanoir, 1 ♂, 1 ♀ Pied Saute, 1 ♂; Ipousin, 5 ♂, 1 ♀. DUTCH GUIANA¹: "interior of," 1 ♂, 2 ♀. BRITISH GUIANA¹: Tumatumari, 2 ♂; Kamakusa, 1 ♂, 2 ♀; Essequibo River, 1 ♂; Minnehaha Creek, 1 ♂. BRAZIL: Rio Castanho, Base Canoas, 1 ♂; Obidos,¹ 1 ♂, 1 ♀; Faro,¹ 6 ♂, 3 ♀; Rio Cauabury,⁵ 1 ♀. VENEZUELA-BRAZIL (frontier): Salto Huá, Serra Imeri,⁶ 1 ♂.

G. r. pallida.—VENEZUELA: Altiplanicie de Nuria, 2 ♂, 5 ♀, 1 (?); Cerro Guaiquinima, 1 ♀; Raudal Guaiquinima, 1 ♂; Boca Chanaro, 1 ♀; Caño Cataniapo, 5 ♂, 1 ♀, 1 (?); Caño Cuao; 1 ♂; San Fernando de Atabapo, 2 ♂, 1 ♀; Las Carmelitas, 1 ♂; Kabadisocaña, 1 ♀.

G. r. pallidigula.—VENEZUELA: Campamento La Cruz, Yavita-Pimichín Portage, 2 ♂ (incl. type); Pimichín, 1 ♂, 1 ♀, 1 ♀ juv.; Cerro Yapacana, 1 ♂, 1 ♀.

Mecocerculus leucophrys palliditergum, new subspecies

Type: From El Junquito, Distrito Federal, Venezuela; altitude 1900 meters. No. 9945, Phelps Collection, Caracas. Adult female collected January 22, 1941, by Fulvio Benedetti. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *M. l. nigriceps* of the Northeastern Cordillera in having a lighter back, more yellowish, less olivaceous and the crown paler, more uniform with the back with less contrast. Differs from *M. l. gularis* of the Mérida Region additionally by shorter wings and tail.

Range: The Central Coast Cordillera from Miranda to Yaracuy, in the Subtropical Zone.

⁶Specimens in U. S. National Museum.

Description of Type: Crown Sepia; back Saccardo's Olive, paler on rump and upper tail-coverts; lores and postocular region dusky; superciliary streak and cheeks whitish. Chin and throat white merging into the pale olivaceous breast which, in turn, merges into the Straw Yellow of abdomen, paler on under tail-coverts; sides of breast olivaceous. Wings Benzo Brown; inner webs of remiges narrowly edged basally with buffy white, more extensive towards tertials; outer vanes of primaries faintly edged basally with grayish, the secondaries more heavily with buffy and tertials heavily and apically with white; upper wing-coverts blackish, the greater and middle coverts broadly tipped with Light Buff; bend of wing Straw Yellow; under wing-coverts and axillaries whitish. Tail Benzo Brown, paler on under surface; rectrices, except outermost, very narrowly edged with olivaceous and narrowly tipped with whitish; outer vanes of outermost ones pale brownish white.

Bill (in life) "black"; feet "black"; iris "reddish." Wing, 59 mm.; tail, 59; exposed culmen, 10; culmen from base, 13; tarsus, 18.

Remarks: Sexes alike in color but females are smaller. Range of measurements: six adult males—wing, 60-65 (63.1) mm.; tail, 60-66 (62.5); culmen from base, 13-14 (13.1). Six adult females—wing, 58-60 (59.7); tail, 55-59 (58); culmen from base, 12-14 (12.2). Six adult males of *nigriceps*—wing, 62-65 (62.6); tail, 59-61 (60.6); culmen from base, 12-13 (12.8); six adult females—wing, 57-60 (58); tail, 56-59 (57.5); culmen from base, 12-13 (12.8). Six adult males of *gularis*—wing, 66-69 (66.6); tail, 65-68 (66); culmen from base, 13-14 (13.3); six adult females—wing, 61-63 (61.6); tail, 60-63 (61.6); culmen from base, 13.

Hellmayr⁶ called the birds from the Cordillera of Mérida *setophagoides*, from the region of Bogotá and the Eastern Andes of Colombia. Examining a series of 37 *setophagoides* from Colombia in the American Museum, and comparing them with Mérida specimens, we found the former more rufous, less olivaceous, on the back and with the crown lighter, approximating the color of back. *Gularis* was described by Madarász from Páramo El Escorial, Mérida, in 1903.

We synonymize *M. l. tachirensis*,⁷ from Queniquea, Táchira, with *gularis* as we do not find its characters constant in the large series of fresh specimens which today are at hand in our collection.

Zimmer⁸ called the birds from the entire northern Cordilleras *nigriceps* but our large series from Páramo de Tamá to Monagas shows that those from the Caracas Region have a lighter back and that those from the west are different from the eastern ones by being larger.

The three specimens in our collection from Cubiro, Lara, are intermediates, having the color of *gularis* and the dimensions of *palliditergum*.

Specimens Examined

M. l. leucophrys.¹—ARGENTINA: 19. BOLIVIA: 9. PERU: 4.

M. l. brunneomarginatus.¹—PERU: 9.

M. l. rufomarginatus.¹—PERU: 4. ECUADOR: 32.

M. l. notatus.¹—COLOMBIA: 37.

M. l. setophagoides.¹—COLOMBIA: 37.

⁶Cat. Birds Amer., V, p.394, 1927.

⁷Phelps and Gilliard, Am. Mus. Nov., No. 1153, p.6, 1941.

⁸Am. Mus. Nov., No. 1045, p.17, 1940.

M. l. gularis.—VENEZUELA: Páramo de Tamá (2400-3000 m.), 3 ♂, 6 ♀, 1 (?) ; Villa Páez, 1 ♂, 1 ♀ ; Páramo Zumbador, 3 ♂, 2 ♀ ; Queniquea, 1 ♀, 2 (?) ; Boca de Monte, Pregonero, 7 ♂, 4 ♀, 2 (?) ; El Valle, Mérida, 1 (?) ; 1 ♂,¹ 1 ♀,¹ 1 (?)¹ ; Llano Rucio, 3 ♂, 1 ♀ ; Páramo Los Conejos, 1 ♂¹ ; Quintero, 2 ♂, 1 ♀ ; Páramo El Escorial, 1 ♂, 1 ♂,¹ 1 ♀¹ ; Páramo La Culata, 1 ♂, 3 ♀, 1 ♂,¹ (?) ;¹ Páramo San Antonio, 2 ♂, 4 ♀ ; Timotes, 1 (?) ; Páramo de Cendé, 7 ♂, 5 ♀, 4 (?) ; Páramo El Jabón, 1 ♂, 1 ♀ ; El Rincón, Páramo Niquitáz, 4 ♂, 1 (?) ; Páramo Misisí, 5 ♂, 3 ♀, 7 (?) ; Cubiro, 2 ♂, 1 ♀ .

M. l. palliditergum.—VENEZUELA: Bucaral, 1 ♀ ; Cumbre de Valencia, 2 ♂¹ ; Colonia Tovar, 3 ♂, 2 ♀, 1 (?) ; No León, 3 ♂, 3 ♀, 1 (?) ; El Junquito, 6 ♂, 4 ♀ (incl. type), 10 (?) ; Galipán,¹ 5 ♂, 5 ♀ ; Ciénagas de Aquilón,¹ 1 ♂, 1 (?) ; Hda. Izcaragua, Guarenas, 1 ♂, 2 ♀ .

M. l. nigriceps.—VENEZUELA: Cerro Negro, Caripe, 7 ♂, 7 ♀, 2 (?) ; Carapas,¹ 2 ♂, 2 ♀ ; Cerro Turumiquire,¹ 1 ♂ ; Los Palmales,¹ 1 ♀ .

M. l. roraimae.—VENEZUELA: Cerro Roraima, 1 ♂, 8 ♂,¹ 3 ♀, 24 ♀¹ ; Cerro Auyan-tepui, 1 ♂, 1 ♀ ; Cerro Ptari-tepui, 9 ♂, 13 ♀, 4 (?) ; Cerro Sororopán-tepui, 2 ♀, 1 (?) ; Cerro Chimantá-tepui, 4 ♂, 4 ♀, 5 (?) ; Cerro Uaipán-tepui, 1 ♀, 2 (?) ; Cerro Aprada-tepui, 2 ♂, 1 ♀, 1 (?) ; Cerro Yaví, 5 ♂, ♀, 1 (?) ; Cerro Duida,¹ 15 ♂, 12 ♀, 4 (?) .

***Campylorhynchus griseus pallidus*, new subspecies**

Type: From Caño Cataniapo, Territorio Amazonas, Venezuela; altitude 100 meters. No. 21106, Phelps Collection, Caracas. Adult male collected February 5, 1943, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: It is the palest of the subspecies, differing from all by the gray color of back, rump and wings instead of buffy-olivaceous, rufous or brown. Differs additionally from *C. g. griseus* in having the mantle mottled with dark brown, instead of uniform with the back, and by a darker crown.

Range: Known only by two specimens from Caño Cataniapo.

Description of Type: Crown and nape Bister, paler on forehead and more dusky on nape; back Drab-Gray, the centers of feathers pale brown giving a mottled appearance, this merging into the dark mantle; rump Buffy Brown; upper tail-coverts grayish and buffy barred with dusky; a prominent white superciliary stripe from bill to neck; lores dusky; wide postorbital streak dusky Bister. Below white. Wings Bister; remiges very narrowly edged with grayish; tertials and upper wing-coverts edged with grayish and barred with dusky; under wing-coverts and axillaries white. Two center pairs of rectrices Bister narrowly edged basally with grayish and narrowly barred with dusky; rest of rectrices blackish brown broadly barred sub-apically with white, more extensively on outer feathers, and tipped with Bister; under surface paler.

Bill (in life) "black, base of lower mandible gray"; feet "dark gray"; iris "reddish brown." Wing, 93 mm.; tail, 82; exposed culmen, 26; culmen from base, 30; tarsus, 31.

Remarks: Sexes alike. Range of measurements: one adult male (type), see above; one adult female—wing, 90 mm.; tail, 84; culmen from base,

¹Cat. Birds Amer. VII, p.129, 1934.

30. *C. g. griseus*: three adult males—wing, 88-94 (91); tail, 81-84 (82.3); culmen from base, 30-31 (30.7). *C. g. minor*: five adult males—wing, 87-92 (89.8); tail, 77-85 (79.6); culmen from base, 30-32 (31.2).

Griseus and *minor* have been considered distinct species and Hellmayr⁹ says: "This bird (*Heleodytes minor*) seems to be specifically distinct from *H. griseus*, both being found along the Caura River." They are so similar in size and color that the extremes of individual variation make it difficult to distinguish one from the other. Nowhere have they been found together with the possible exception of the Lower Caura cited above by Hellmayr. He only lists one specimen of *griseus* from the Caura River and does not state the exact locality, "Caura River" only. The lack of a precise locality suggests the possibility of this being a trade skin which are, in many cases, of doubtful origin. At any rate, it was probably not collected at Maripa, from where the specimens of *minor* came, in which case the two birds would not occur together. It is also possible that the single Caura skin was not in fresh plumage, in which case the identification would have been difficult. Consequently we presume that, if it is true that *griseus* occurs on the Lower Caura, it is not together with *minor*.

The only difference between *griseus* and *minor* is the color of the back and the slight buffy tint to the under parts of the latter. The pattern of the white bands on the tail, extremely complicated, is identical.

The specimen of *griseus* in the U. S. National Museum from Puerto Ayacucho brings the range of this subspecies very close to the type locality of *pallidus*, distant about ten miles.

The ranges of the known subspecies are: *griseus*—southern British Guiana; Brazil on the Rio Branco in the region of Boa Vista and Rio Parime; Venezuela in the eastern and northern Territorio Amazonas and in the region of Caicara on the lower Orinoco. *pallidus*—northern Terr. Amazonas. *minor*—Lower Caura, Lower Orinoco, the llanos and the northeastern coastal region. *albicillius*—from Lara and Falcón to the Colombian frontier and in northern Colombia. *bicolor*—known only from "Bogota" trade skins.

Specimens Examined

C. g. griseus.—El Platanal, Caño Parucito, Río Ventuari, 2 ♀; Caicara¹, 3 ♂, 3 ♀; Altigracia,¹ 4 ♂, 2 ♀; Puerto Ayacucho,⁵ 1 ♀. BRAZIL: Serra da Lua,¹⁰ 3 ♂, 3 ♀; Boa Vista, 3 ♂; Rio Parime⁵, 1 ♀.

C. g. pallidus.—VENEZUELA: Caño Cataniapo, 1 ♂ (type), 1 ♀.

C. g. minor.—VENEZUELA: San Antonio del Golfo, 1 ♂; Los Altos, 1 ♂; Bergantín, 1 ♀; Puerto La Cruz, Anzoátegui, 1 ♀; Barcelona, 2 ♂, 3 ♀; Cantaura,⁵ 1 ♀; Santa Maria de Ipire, 3 ♂, 1 ♀; Pasiaguán, 1 ♂; Temblador, 1 ♀; Río Guanipa,¹¹ 1 ♀; Altigracia de Ortiuco, 3 ♂, 2 ♀, 2 (?); Soledad,⁵ 1 ♀; El Sombrero, 1 ♂, 1 ♀; San Carlos, Cojedes, 1 ♂, 1 ♀; Veguita, 1 ♂, 2 ♀; Ciudad Bolivia, 1 ♂, 1 ♀; Guasdalito, 2 ♂; El Amparo, 1 ♂, 1 (?); "Orinoco,"¹¹ 2; Altiplanicie de Nuria, 1 ♂; Ciudad Bolívar,¹ 3 ♂; Maripa,¹ 4 ♂, 5 ♀. BRAZIL: Frechal, Rio Surumu,¹ 3 ♂, 2 ♀; Limao, Rio Cotinga,¹ 2 ♂.

C. g. albicillius.—VENEZUELA: Cubiro, 2 ♂, 1 ♀; Quebrada Arriba, 1 ♂, 1 (?); Quiuragua, 1 ♂; Curimagua, 2 ♂; Sabaneta, 1 ♂, 1 ♀;

¹⁰Specimens in Chicago Natural History Museum.

¹¹Specimens in Academy of Natural Sciences, Phila.

Maracaibo,¹ 2 (?); Mene Grande, 3 ♂, 1 ♀; Santa Bárbara de Zulía, 1 ♂, 3 ♀; El Vigía, 3 ♂; Villa de Rosario, 2 ♀; La Sierra, 2 ♂, 1 (?); Paraguaipoa, 4 ♀. COLOMBIA¹: Santa Marta region, 8; Calamar, 2 ♂, 1 ♀; La Playa, 1 ♂, 1 ♀; Río Suno, 1 ♀; Turbaco, 1 ♂.

C. g. bicolor—COLOMBIA¹: “Bogotá,” 5.

***Diglossa major chimantae*, new subspecies**

Type: From Cerro Chimantá-tepui, Gran Sabana, Bolívar, Venezuela; altitude 2000 meters. No. 36119, Phelps Collection, Caracas. Adult male collected July 14, 1946, by Kathleen D. Phelps. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *D. m. disjuncta* of Mts. Ptari-tepui, Sororopán-tepui, Aprada-tepui and Uaipán-tepui but differs in being more grayish below, less bluish and with less, or no indication of streaks on the breast. Differs from *D. m. major*, from Mt. Roraima, in having the crown pale blue, almost immaculate instead of fuscous with the edges of the feathers blue. Differs notably from *D. m. gilliardi*, from Mt. Auyan-tepui, by the lack of the prominent streaks on the breast and by being much paler below.

Range: Known only from Mt. Chimantá-tepui, in the Subtropical Zone, on the summit at 2000 meters and at the base of the western wall at 1600 meters.

Description of Type: Crown Persian Blue, the dusky centers of the feathers showing on the anterior part; back and rump blackish, the feathers with prominent Persian Blue shaft stripes; upper tail-coverts more bluish with less prominent shaft stripes; forehead, lores and sides of head black. Chin black; throat, breast, abdomen, sides and flanks Light Neutral Gray; shanks black; feathers of vent mixed with whitish; under tail-coverts Auburn X Sanford's Brown. Wings Fuscous-Black, the primaries, except the first, and the outer secondaries narrowly edged with bluish gray except near the tips; median and lesser upper wing-coverts streaked uniform with the back; greater series largely blackish, with short pale streaks at the tips; under wing-coverts and axillaries grayish. Tail black above, Dark Mouse Gray below, with outer vanes of rectrices narrowly edged with Deep Payne's Gray, obsolete on the outermost pair; rectrices both above and below very faintly barred. Bill (in life) “black”; feet “black”; iris “brown.” Wing, 84 mm.; tail, 72; exposed culmen, 16; culmen from base, 18; tarsus, 25.

Remarks: Sexes alike in color. Chubb¹² says that the male of *D. m. major* (from Cerro Roraima) is similar to the female except that the small chestnut patch on the breast is missing. We consider the lack of this patch merely individual variation inasmuch as among our ten adult specimens from Mt. Roraima four have these chestnut feathers (on the forward breast) and of these three are females and one is a male. Of the six remaining specimens which have no chestnut, three are females, two are males and the other is of undetermined sex. Of our 16 specimens of *disjuncta*, from Mts. Ptari-tepui and Sororopán-tepui, none has indications of the chestnut on the breast.

Juvenile plumage. In our collection we have no juveniles excepting of *major* from Mt. Roraima. There are three specimens of these, with

¹²Birds of British Guiana, Vol. II, p. 475, 1921.

a very different plumage from the adults. Above, they are dark brown instead of black with merely indications of streaks on some feathers; below, they are of a lighter brown with white on throat and abdomen, with indistinct white spots on the breast. The feathers of the greater wing-coverts have white tips.

Range of measurements: five adult males—wing, 84-90 (88) mm.; tail, 72-82 (77.6); culmen from base, 18-19 (18.4). Five adult females—wing, 80-87 (83.2); tail, 72-77 (74.8); culmen from base, 18-19 (18.8).

The species *major*, up till now, is confined to the Subtropical Zone on the high plateau summits of the Gran Sabana. It is a very unstable species inasmuch as already four subspecies have been described from this region which is only 130 miles long by 100 miles wide. These are: Roraima, *D. m. major*; Auyan-tepui, *D. m. gilliardi*; Ptari-tepui, Sororopán-tepui, Aprada-tepui and Uaipán-tepui, *D. m. disjuncta*; and Chimantá-tepui, *D. m. chimantae*.

It is possible that the form which lives on Uaipán-tepui is new because the short series of four specimens in our collection shows differences which might be confirmed by a longer series.

Specimens Examined

D. m. major.—VENEZUELA: Cerro Roraima, 3 ♂, 6 ♀, 1 (?); 2 ♂ juv., 1 ♀ juv.

D. m. gilliardi.—VENEZUELA: Cerro Auyan-tepui, 2 ♂, 1 ♀.

D. m. disjuncta.—VENEZUELA: Cerro Ptari-tepui, 11 ♂, 11 ♀, 1 (?); Cerro Sororopán-tepui, 1 ♂, 3 ♀; Aprada-tepui, 1 ♂, 1 (?); Uaipán-tepui, 1 ♂, 3 ♀.

D. m. chimantae.—VENEZUELA: Cerro Chimantá-tepui, 13 ♂ (incl. type), 22 ♀, 2 (?).



EXPLANATION OF PLATE VII

- | | | | |
|----|-----------------------|----|-----------------------|
| 50 | Altagracia | 20 | Cerrón, Cerro El |
| 35 | Altagracia de Orituco | 66 | Chanaro, Boca |
| 53 | Altiplanicie de Nuria | 72 | Chimantá-tepui, Cerro |
| 37 | Altos, Los | 31 | Ciénagas de Aquilón |
| 48 | Amparo, El | 52 | Ciudad Bolívar |
| 71 | Aprada-tepui, Cerro | 13 | Ciudad Bolivia |
| 74 | Arabupú | 27 | Colonia Chirgua |
| 69 | Auyan-tepui, Cerro | 30 | Colonia Tovar |
| 36 | Barcelona | 10 | Conejos, Páramo Los |
| 38 | Bergantín | 55 | Cua, Caño |
| 7 | Boca de Monte | 18 | Cubiro |
| 24 | Bucarál | 12 | Culata, Páramo La |
| 49 | Caicara | 28 | Cumbre de Valencia |
| 62 | Campamento La Cruz | 22 | Curimagua |
| 43 | Cantaura | 64 | Duida, Cerro |
| 31 | Caracas | 11 | Escorial, Páramo El |
| 39 | Carapas | 31 | Galipán |
| 41 | Caripe | 47 | Guasqualito |
| 60 | Carmelitas, Las | 34 | Golfo Triste, Cerro |
| 54 | Cataniapo, Caño | 68 | Guaiquinima, Cerro |
| 17 | Cendé, Páramo de | 67 | Guaiquinima, Raudal |

EXPLANATION OF PLATE VII (Continued)

42	Guanipa, Río	12	Quintero
32	Guarenas	23	Quiuragua
63	Húa, Salto	59	San Fernando de Atabapo
32	Izcaragua, Hacienda	32	San José de Los Caracas
17	Jabón, Páramo El	8	Santa Bárbara de Zulia
31	Junquito, El	29	Santa Clara, Hacienda
65	Kabadisocaña	17	Rincón, El
73	Kukenam, Cerro	73	Rondón Camp
12	Llano Rucio	73	Roraima, Cerro
2	Maracaibo	21	Sabaneta
51	Maripa	12	San Antonio, Páramo
19	Mene Grande	40	San Antonio del Golfo
11	Mérida	25	San Carlos (Cojedes)
16	Misisí, Páramo	45	Santa María de Ipire
41	Negro, Cerro (Caripe)	4	Sierra, La
35	Negro, Cerro (Miranda)	33	Sombrero, El
17	Niquitáz, Páramo	75	Sororopán-tepui, Cerro
30	No León	5	Tamá, Páramo de
39	Palmals, Los	26	Taria
1	Paraguaipoa	46	Temblador
56	Paraque, Cerro	14	Timotes
44	Pariaguán	39	Tumumiquire, Cerro
58	Parucito, Caño	70	Uaipán-tepui, Cerro
62	Pimichín	11	Valle, El (Mérida)
58	Platanal, El	15	Veguita
7	Pregonero	9	Vigía, El
75	Ptari-tepui, Cerro	5	Villa Páez
54	Puerto Ayacucho	3	Villa del Rosario
36	Puerto La Cruz (Anzoátegui)	61	Yacapana, Cerro
20	Quebrada Arriba	57	Yaví, Cerro
6	Queniquea	62	Yavita
28	Quiguas, Las	6	Zumbador, Páramo

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SOME UNTENABLE NAMES IN THE OLD WORLD
FLYCATCHERS

BY H. G. DEIGNAN*

Hartert (Vögel der paläarktischen Fauna, vol. 1, hft. 4, 1907, pp. 473-494) first showed that the numerous Old World flycatchers placed by Bowdler Sharpe in the ill-defined "genera" *Hemichelidon*, *Alseonax*, *Ficedula*, *Siphia*, *Cyornis*, *Digenea*, *Poliomyias*, *Zanthopygia*, and *Cyanoptila* could not logically be kept separate from the Brissonian genus *Muscicapa*. Delacour and Mayr (Zoologica, vol. 30, No. 12, Nov. 15, 1945, p. 113), in full agreement with Hartert, added to the number *Muscicapula*, *Dendrobiastes*, and *Eumyias*. Delacour (Zoologica, vol. 31, No. 1, Apr. 29, 1946, p. 4) brought in also *Niltava* and *Oreicola*, and, in Birds of Malaysia, 1947, *Anthipes* and *Muscicapella*.

I am in complete accord as to the desirability of such widespread "lumping," which might well include *Ochromela*, and only regret that so many familiar names of generally accepted species and subspecies become invalid when employed with *Muscicapa*. Since the correction of nomenclature has not kept pace with the union of genera, I shall attempt in the following paragraphs to establish tenable names for at least a majority of the recognizable Asiatic forms affected.

1. *Hemichelidon sibirica fuliginosa* Hodgson (Stuart Baker, Fauna of British India, Birds, ed. 2, vol. 7, 1930, p. 130) becomes *Muscicapa sibirica cacabata* Penard (Proc. New England Zool. Club, vol. 7, Oct. 31, 1919, p. 22), a substitute name for *H. [emichelidon]. fuliginosa* Hodgson (Proc. Zool. Soc. London, pt. 13, Aug. 1845, p. 32: Nepal), not [*Muscicapa*] *fuliginosa* Gmelin, 1789, or *Muscicapa fuliginosa* Sparrman, 1787.

2. *Hemichelidon ferruginea* Hodgson (Stuart Baker, Fauna of British India, Birds, ed. 2, vol. 7, 1930, p. 130) becomes *Muscicapa rufilata* (Swinhoe) with type locality Amoy, Fukien Province, China (Ibis, 1860, p. 57), since the name is otherwise preoccupied by *Muscicapa ferruginea* Merrem, 1784.

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3. *Siphia parva hyperythra* Cabanis (Stuart Baker, Fauna of British India, Birds, ed. 2, vol. 7, 1930, p. 131) may be called

***Muscicapa migrator*, new name**

for *Siphia hyperythra* Cabanis (Journ. für Orn., vol. 14, Nov. 1866, p. 391: Ceylon), not *Muscicapa hyperythra* Blyth, 1842.

4. *Muscicapula concreta cyanea* Hume (Stuart Baker, Fauna of British India, Birds, ed. 2, vol. 7, 1930, p. 132) becomes *Muscicapa concreta leucoprocta* (Tweeddale) with type locality Mount Mulayit, Tenasserim, since the name is otherwise preoccupied by *Muscicapa cyanea* Bebbie, 1834, *Muscicapa cyanea* Vieillot, 1818, and *Muscicapa cyanea* P. L. S. Müller, 1776.

5. *Muscicapula hodgsonii* Verreaux (Stuart Baker, Fauna of British India, Birds, ed. 2, vol. 7, 1930, p. 132) may be called

***Muscicapa amabilis*, new name**

for *Siphia hodgsonii* Verreaux (Nouv. Arch. Mus. [Paris], vol. 6, "1870" [= 1871], Bull., p. 34: Chinese Tibet), not *Nemura hodgsoni* Moore, 1854.

Siphia erithacus Blyth, 1861, is unavailable for this bird because preoccupied by *S* [*iphia*]. *erythaca* Blyth, 1847, and *Muscicapa erythaca* Swainson, 1838; *Cyornis brevirostris* Bingham, 1900, is unavailable because preoccupied by *M* [*uscicapa*]. *brevirostris* Wied, 1831.

6. *Dendrobiastes hyperythra malayana* Ogilvie-Grant (Chasen, Hand-list of Malaysian Birds, 1935, p. 169) may be called

***Muscicapa hyperythra oliga*, new name**

for *Muscicapula malayana* Ogilvie-Grant (Bull. Brit. Orn. Club, vol. 19, Oct. 29, 1906, p. 10: Gunong Tahan, Malaya), not *Digenea malayana* Bowdler Sharpe, 1879.

Dendrobiastes hyperythrus sumatranus Hachisuka, 1926, is unavailable for this bird because preoccupied by *Niltava sumatrana* Salvadori, 1879.

7. *Muscicapula hyperythra luzoniensis* Ogilvie Grant (Hachisuka, Birds of the Philippine Islands, pt. 4, 1935, p. 297) may be called

***Muscicapa hyperythra trinitatis*, new name**

for *Muscicapula luzoniensis* Ogilvie Grant (Ibis, ser. 6, vol. 6, Oct. 1894, p. 505: northern Luzón, Philippine Islands), not [*Muscicapa*] *luzoniensis* Gmelin, 1789.

Muscicapula hyperythra mindorensis Hachisuka, 1935, is unavailable for this bird because preoccupied by *Cyornis mindorensis* Mearns, 1907.

8. *Muscicapula tricolor tricolor* Hodgson (Stuart Baker, Fauna of British India, Birds, ed. 2, vol. 7, 1930, p. 132) becomes *Muscicapa leucomelanura leucomelanura* (Hodgson) with type locality Nepal, since the name is otherwise preoccupied by *Muscicapa tricolor* Hartlaub, 1845, and *Muscicapa tricolor* Vieillot, 1818.

9. *Muscicapa melanoleuca melanoleuca* Blyth (Stuart Baker, Fauna of British India, Birds, ed. 2, vol. 7, 1930, p. 133) becomes *Muscicapa wes-*

termanni collini Rothschild, ex *Muscicapa collini* Rothschild (Bull. Brit. Orn. Club, vol. 45, Apr. 25, 1925, p. 90), a substitute name for *Muscicapa blythi* Rothschild (Nov. Zool., vol. 28, May 1921, p. 48), not *Muscicapa blythi* Giebel, 1875. *Muscicapa blythi* Rothschild was itself a substitute name for *M* [*uscicapula*]. *melanoleuca* Blyth (Journ. Asiat. Soc. Bengal, vol. 12, 1843, p. 940: Nepal, Darjiling), not *Muscicapa Melanoleuca* Forster, 1817, or *Muscicapa Melanoleuca* Gldenstdt, 1775.

Muscicapa pusilla Tickell, 1860, is unavailable for this bird because preoccupied by *Muscicapa pusilla* Wilson, 1811.

10. *Stoporala indigo cerviniventris* Bowdler Sharpe (Chasen, Handlist of Malaysian Birds, 1935, p. 181) may be called

***Muscicapa indigo delicata*, new name**

for *Stoparola cerviniventris* Bowdler Sharpe (Ibis, ser. 5, vol. 5, Oct. 1887, p. 444: Mount Kinabalu, British North Borneo), not *Digenea cerviniventris* Bowdler Sharpe, 1879.

11. *Anthipes moniliger gularis* Blyth (Ticehurst, Journ. Bombay Nat. Hist. Soc., vol. 36, No. 4, 1933, p. 926) may be called

***Muscicapa solitaris arakanensis*, new name**

for *A* [*nthipes*]. *gularis* Blyth (Journ. Asiat. Soc. Bengal, vol. 16, pt. 1, 1847, p. 122: Arakan), not *Muscicapa gularis* Quoy and Gaimard, 1830, *Muscicapa gularis* Temminck, 1822, or *Muscicapa gularis* Stephens, 1817.

12. *Cyornis rufigastra longipennis* Chasen and Boden Kloss (Chasen, Handlist of Malaysian Birds, 1935, p. 166) may be called

***Muscicapa rufigastra lepidula*, new name**

for *Cyornis rufigastra longipennis* Chasen and Boden Kloss (Treubia, vol. 12, livr. 3-4, Dec. 1930, p. 271: Karimon-Java Island, Java Sea), not *Muscicapa longipennis* Lesson, 1830-1831.

13. [*Muscicapa rufigaster*] *simplex* (Delacour and Mayr, Birds of the Philippines, 1946, p. 211) may be called

***Muscicapa rufigastra simplicior*, new name**

for *Cyornis simplex* Blyth (Ibis, ser. 2, vol. 6, Apr. 1870, p. 165: no locality given = Luzn, Philippine Islands), not *M*[*uscicapa*]. *simplex* Lichtenstein, 1823.

14. *Cyornis banyumas cantatrix* Temminck (Chasen, Handlist of Malaysian Birds, 1935, p. 167) may be called

***Muscicapa banyumas liga*, new name**

for *Muscicapa cantatrix* Temminck (Nouveau recueil de planches colories d'oiseaux, livr. 38, Sept. 1823, pl. 226: Java), not *Muscicapa cantatrix* Wilson, 1810.

Temminck's name has been untenable since its first appearance.

15. *Cyornis caeruleata rufifrons* Wallace (Chasen, Handlist of Malaysian Birds, 1935, p. 167) becomes *Muscicapa coerulata nigrogularis*

(Everett) with type locality Mount Penrisen, Sarawak, since the name is otherwise preoccupied by *M* [*uscicapa*]. *rufifrons* Latham, 1801.

16. *Cyornis caerulata albiventer* Junge (Chasen, Handlist of Malaysian Birds, 1935, p. 167) may be called

***Muscicapa caerulata deliensis*, new name**

for *Cyornis caerulata albiventer* Junge (*Ardea*, vol. 22, Dec. 1933, p. 105: Deli, northeastern Sumatra), not *Muscicapa albiventer* von Spix, 1825.

17. *Cyornis superba* Stresemann (Chasen, Handlist of Malaysian Birds, 1935, p. 167) may be called

***Muscicapa venusta*, new name**

for *Cyornis superba* Stresemann (*Orn. Monatsber.*, vol. 33, No. 2, Mar. 1, 1925, p. 52: Mount Penrisen, Sarawak), not *Muscicapa superba* Bechstein, 1794.

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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 61

1948



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By a change in the By-Laws of the Biological Society of Washington, effective March 27, 1926, the fiscal year now begins in May, and the officers will henceforth hold office from May to May. This, however, will make no change in the volumes of the Proceedings, which will continue to coincide with the calendar year. In order to furnish desired information, the title page of the current volume and the list of newly elected officers and committees will hereafter be published soon after the annual election in May.

All correspondence should be addressed to the Biological Society of Washington, c/o U. S. National Museum, Washington, D. C.

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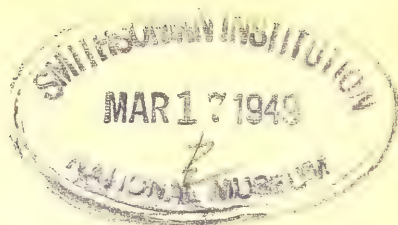


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DATES OF ISSUE

The Committee on Publication declares that each paper of this volume was distributed on the date indicated on its initial page. The table of contents, minutes of meetings, and index for 1948 were issued on March 17, 1949. The title page and lists of officers and committees for 1947-1948 (pp. i-iv) were issued on September 3, 1948.

**PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON**

PROCEEDINGS

The Society meets from October to May on the second Saturday of each month at 8 P.M. All meetings in 1948 were held in Room 43 of the U. S. National Museum.

January 10, 1948—971st Meeting

President Aldrich in the chair; 75 persons present.

New members elected: Madison Briscoe, Marie B. Clark, Marle H. Markley, Lorina Wendt. Emeritus member elected: May T. Cooke.

Informal communications: E. P. Walker, Note on a sparrow hawk catching a starling; Frank Thone, Note on the photographs of birds and insects made by Rev. John Baechle and exhibited at the Chicago meeting of the A.A.A.S.

Formal communication: Alexander Wetmore, A naturalist in Darien.

February 14, 1948—972d Meeting

President Aldrich in the chair; 68 persons present.

News members elected: E. G. S. Baker, Kingston Bowman, Walter C. Brown, Thomas D. Burleigh, Murray L. Johnson, Catherine E. Kenny, Richard A. Terry.

Informal communications: Frank Thone, Exhibition of new books; I. N. Hoffman, Note on a visit to the Bear River marshes, Utah.

Formal communication: W. F. Kubichek, The Bear River Refuge.

March 13, 1948—973d Meeting

President Aldrich in the chair; 67 persons present.

New members elected: Clarence J. Gibbs, Jr., F. William Spaeth.

Informal communications: Frank Thone, Exhibition of new books; E. P. Walker, Note on a new apparatus for taking flashlight photographs of small mammals; M. K. Brady, Exhibition of photographs of the cuzumbia.

Formal communication: E. R. Kalmbach, Colorado: birds, beasts, and the rainbow.

April 10, 1948—974th Meeting

President Aldrich in the chair; 14 persons present.

New members elected: Walter Brown, Horton H. Hobbs, Jr., William A. Lunk, William H. Phelps, Jr.

Informal communication: Frank Thone, Exhibition of new books.

Formal communication: Lloyd A. Spindler, The biological status of *Sarcocystis*.

May 8, 1948—975th Meeting

SIXTY-NINTH ANNUAL MEETING

President Aldrich in the chair; 17 persons present.

New members elected: George F. Edmunds, Robert R. Harry, Emmet T. Hooper. Life member elected: William H. Phelps.

The reports of the Recording Secretary and the Treasurer were presented.

The following officers were elected: President, J. W. Aldrich; Vice-presidents, W. L. Schmitt, F. C. Lincoln, J. E. Benedict, Jr., W. A. Dayton; Recording Secretary, S. F. Blake; Corresponding Secretary, D. H. Johnson; Treasurer, A. J. Duvall; Members of Council, Malcolm Davis, W. Stickel, Hugh O'Neill, L. K. Couch, H. G. Deignan.

The business meeting was followed by an open meeting, with 34 persons present.

Formal communication: Malcolm Davis and A. J. Duvall, From the Arctic to the Antarctic in search of animal life.

October 9, 1948—976th Meeting

Vice-president Dayton in the chair; 30 persons present.

Informal communications: Frank Thone, Exhibition of new

books; S. F. Blake, Note on observations of American egret in New England and New Jersey.

Formal communication: G. E. Letner, Canaries, their care and management.

November 13, 1948—977th Meeting

President Aldrich in the chair; 75 persons present.

New members elected: Ernest P. Edwards, Theodore French, Howard K. Gloyd, E. G. Holt, K. R. Kelson, Stanley Mulaik, Orlando Park.

Formal communication: O. S. Aamodt, The soils of Alaska in relation to vegetation.

December 11, 1948—978th Meeting

President Aldrich in the chair; 85 persons present.

New members elected: Ralph S. Focht, H. S. Fuller, H. C. Hanson, W. H. Harrison, Ignatius Lempart, Romeo Mansueti, J. V. Owens, Albert C. Smith.

Informal communication: Frank Thone, Exhibition of new books.

Formal communication: Herbert C. Hanson, Ecology and agriculture in Alaska with special reference to the Matanuska Valley.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

RACES OF THE BULBUL *MICROSCELIS*
CHARLOTTAE (FINSCH) AND ITS RELATIVES

By H. G. DEIGNAN

Published with permission of the Secretary of the Smithsonian Institution.

With the cooperation of the authorities of the Museum of Comparative Zoology (M.C.Z.), of the American Museum of Natural History (A.M.N.H.), of the Academy of Natural Sciences of Philadelphia (A.N.S.P.), and of the Chicago Natural History Museum (C.N.H.M.), to all of whom my thanks are hereby tendered, I have brought together in Washington 194 specimens of the small olive bulbuls that have been combined under the name *Microscelis charlottae* (Finsch) by the more recent authors, and by the earlier ones under that of *Iole olivacea* Blyth.

While attempting to group them into subspecies, I was astonished to find that the more golden forms known as *viridescens* and the more greenish-to-brownish ones hereinafter to be called *charlottae* occur together throughout an extensive area, at least in eastern Burma and western Siam, without any external sign of intergradation. Recognition of this fact requires, of course, that in future they be treated as distinct, partially sympatric species.

The Tenasserim material before me shows that while possibly *charlottae* alone inhabits the Mergui District, *viridescens* and *charlottae* appear together in the Amherst and Thaton Districts farther north. Since most of my specimens must have been handled by Hume, it is somewhat surprising to find that authority reporting only *viridescens* from the Division (Stray Feathers, vol. 6, 1878, pp. 315-317). If, however, collecting the two in numerous places together, he had assumed that he was dealing simply with one individually variable form, his placing of both under one name would cease to be puzzling. That he had made just such an assumption is indicated by his two detailed diagnoses of *viridescens*, which must have been drawn from a composite series; the theory is further strengthened by his observation, "It is [a bird] of which it is extremely difficult to convey by words a really correct idea," and by his description of the irides as "excessively variable, probably according to age, dark slaty, clear grey, salmon pink, pale golden brown."

The imperfectly known provinces of southwestern Siam immediately adjacent to the Amherst and Thaton Districts, whose avifauna they

share, have so far produced but one example of the group, and this is *viridescens*. But since *charlottae* occurs south, west, and north of them, it may be predicted with complete confidence that it will eventually be found *within* these provinces as well.

A series from the provinces of northwestern Siam are, with one exception, *charlottae*; the odd bird is inseparable from the population of northeastern Burma that I shall name below as a race of *viridescens*. Although I am inclined to believe that this specimen is merely a winter visitor from farther north, there is nevertheless a good chance that it was resident where collected; other cases are known of forms ranging unchanged from Myitkyina through the Shan States to Siam.

Wardlaw Ramsay long ago found *viridescens* in the Karen Hills, and Smith, Garthwaite, and Smythies (Journ. Bombay Nat. Hist. Soc., vol. 43, 1942, p. 467) have recently reported it from Thandaung in the same region. Smythies (Birds of Burma, 1940, pp. 510-511), without comment, gives two races of *charlottae* from these hills, but omits *viridescens* altogether. I myself have seen, from the same general area, a specimen of *viridescens* taken in the Salween District of Burma and another of *charlottae* collected in the adjacent Siamese province of Mae Hong Son.

Smythies (*loc. cit. supra*), again without gloss, records both *viridescens* and *charlottae* from the Chin Hills. That the former, described from Arakan, should occur there, is quite to be expected, but that what was obviously believed by the author to be the more eastern representative of the same species should *also* appear on the borders of Arakan is either erroneous or a fact of the greatest significance. Strong support is given the latter alternative by Heinrich's specimens from Mount Victoria discussed below in "Remarks" under *M. v. viridescens*.

If *charlottae* and *viridescens* actually represent distinct specific entities, it is unfortunately true that there seems to be no *definite* external character by which the forms of one may be known from those of the other except the color of the iris, which in *charlottae* is gray or white, and in *viridescens* is reddish or brown. While so feeble a distinction is far from satisfactory, yet an analogy is afforded within the family by the sympatric *Pycnonotus simplex* and *P. brunneus*, which are similarly conveniently separable only by eye color.

If the color of the irides be deemed to have specific importance in the cases of *M. viridescens* and *M. charlottae*, the conclusion is inescapable that the isolated *M. palawanensis* of Paláwan, with lemon-yellow eyes and a plumage more like that of the distant *viridescens* than like those of its geographically nearest neighbors, must likewise be elevated to the rank of a species. This bird has by some writers (Robinson, Hachisuka) been treated as a race of *Criniger finschii* of Borneo, Malaya, and Sumatra, but I must agree with Delacour and Mayr that it is actually a member of the genus *Microscelis* (*in sensu lato*) and certainly nearly related to *viridescens* and *charlottae*.

At any rate, until such time as my assumption of the overlapping breeding ranges of *viridescens* and *charlottae* has been proved false, I must hold that *Microscelis viridescens*, *M. charlottae*, and *M. palawanensis* represent three allied but distinct species. Of the group, the forms apparently worthy of subspecific recognition are discussed below.

1. *Microscelis viridescens* (Blyth)

1. *Microscelis viridescens viridescens* (Blyth)

I [ole]. *viridescens* Blyth, Journ. Asiat. Soc. Bengal, vol. 14, pt. 2, Aug. 1845, p. 573 (Arakan Division, Burma).

Iole viridescens Blyth, Ibis, ser. 2, vol. 3, Jan. 1867, p. 7. New name for *I* [ole]. *viridescens* Blyth, 1845 (Arakan Division, Burma), not *Ixos viridescens* Temminck, 1825.

Diagnosis.—Pointed feathers of crown brownish olive green; mantle olive green; upper tail coverts bright rufescent brown; exposed portions of remiges and rectrices rufescent brown, edged with brownish olive; lores and indistinct supercilium olive yellow; sides of head yellowish olive; under parts dull olivaceous, paler on the throat (where ashy-gray bases of the feathers are usually visible), everywhere streaked and suffused with bright light yellow, more yellow on the center of the abdomen, more olivaceous along the flanks (which are posteriorly faintly suffused with ochraceous); under tail coverts yellowish buff.

Wing length.—78-82 mm. (3 males), 72-78 mm. (5 females).

Specimens examined.—SIAM: Southwest: Ban Nong Pla Lai (1 female); BURMA: South: "Pegu Yoma" (1 male); Amherst District: "Oohoo Choung" (1 female); Amherst or Thaton District: "Thoung-yin" (1 female), "Thaungyin Valley" (1 female), "Hteekotaw Chg Laidawgee" (1 male); Salween District: Sinzwe Forest, Yunzalin River (1 male); Yamethin District: Foot of Mount Byingyi (1 female).

Remarks.—The specimen from "Pegu Yoma" is the most nearly topotypical *I* have seen; it seems to be inseparable from those of *Tenasserim*.

Stresemann and Heinrich (Mitteil. Zool. Mus. Berlin, vol. 24, 1940, p. 181) have reported from Mount Victoria two males under the name *Iole olivacea viridescens*. Since at this locality *M. v. viridescens* might be expected to occur, it is of very considerable interest to note that their specimens had wing lengths of 85 and 87 mm. and the irides "grünlichweiss" and "beige-grau." One must wonder whether a large, gray-eyed form of *viridescens* is localized on Mount Victoria or whether, as is highly probable, these examples represent an undescribed race of *charlottae* occurring far within the range of *viridescens*.

2. *Microscelis viridescens cacharensis*, subsp. nov.

Type.—C.N.H.M. No. 98479, adult male, collected at "Chutla Bhil," Cachar District, Surma Valley and Hill Division, Assam Province, India, in 1897, by A. M. Primrose.

Diagnosis.—Near to *M. v. viridescens*, but with the olives and yellows of the plumage everywhere deeper in tone (most obviously on the lores, sides of the head, and under parts).

Wing length.—82 mm. (1 male), 80 mm. (1 female).

Specimens examined.—ASSAM: Cachar District: "Chutla Bhil" (1 male, 1 female).

3. *Microscelis viridescens myitkyinensis*, subsp. nov.

Type.—A.M.N.H. No. 307094, adult male, collected at elev. 1,000 ft. along the Shingaw-Tanga road, Myitkyina District, Sagaing Division, Burma, on November 20, 1938, by the Vernay-Cutting Expedition (original number 52).

Diagnosis.—Distinguished from *M. v. cacharensis* and *M. v. viridescens* by having the pointed feathers of the crown more olivaceous brown than brownish olive green; the mantle a deeper and almost brownish olive green; the upper tail coverts a dark olivaceous brown; the exposed portions of the remiges and rectrices a dark olivaceous brown, edged with brownish olive (darker than in *cacharensis*); the sides of the head brownish olive; the throat ashy gray, merely streaked with yellow; the remaining under parts as described for *viridescens*, but everywhere deeper in tone (much as in *cacharensis*) and more obviously yellow-streaked; the under tail coverts cinnamon buff.

Wing length.—91 mm. (1 male), 83-87 mm. (4 females).

Specimens examined.—BURMA: Myitkyina District: Shingaw-Tanga road (1 male), Tamu (1 female); Ruby Mines District: Kabaing (1 female); Hsipaw State: Gokteik Gorge (1 female); SIAM: Northwest: Ban Samoeng Tai (1 female).

Remarks.—The specimen from northwestern Siam (lat. 18°50' N., long. 98°45' E.), of which the eye color is unfortunately not recorded, agrees at least in every other external character with the series from northeastern Burma, although not with any other Siamese example. Inasmuch as it was collected on November 23, I consider it a winter wanderer, perhaps from no great distance, for Ticehurst (Journ. Bombay Nat. Hist. Soc., vol. 39, 1937, p. 554) found that birds taken as far south as Mong Kung (lat. 21°37' N., long., 97°32' E.) were inseparable from those of Myitkyina.

M. v. myitkyinensis is the form discussed by Mayr (Ibis, 1941, p. 103), who, however, compared it only with birds of northern Indochine (*charlottae*).

II. *Microscelis charlottae* (Finsch)

1. *Microscelis charlottae aquilonis*, subsp. nov.

Type.—A.M.N.H. No. 565615, adult (unsexed), collected at Backan (lat. 22°08' N., long. 105°50' E.), Backan Province, northeastern Tongking, on December 8, 1926, by J. Delacour and P. Jabouille (original number 1652).

Diagnosis.—Pointed feathers of crown dark rufescent brown; mantle dark brownish olive green; upper tail coverts dark rufescent brown; exposed portions of remiges and rectrices dark brown, edged with olivaceous brown; lores and indistinct supercilium olivaceous gray; sides of head dull brownish olive; throat ashy gray, streaked with light yellow; remaining under parts dull olivaceous, streaked and suffused with light yellow, more yellow on the center of the abdomen, more olivaceous along the flanks (which are posteriorly suffused with ochraceous); under tail coverts cinnamon buff.

From *M. c. propinquus*, the geographically nearest race, with which it has been heretofore confused, *aquilonis* is easily separable by the darker and browner coloration of its upper parts, the rather deeper olivaceous and yellow of its under parts, and the slightly darker cinnamon buff of its under tail coverts.

Wing length.—86-92 mm. (5 males), 85 mm. (1 female), 86-87 mm. (3 unsexed).

Specimens examined.—TONGKING: Backan Province: Backan (1 unsexed); ANNAM: Thanhhoa Province: Hoixuan (5 males, 1 female, 2 unsexed).

2. *Microscelis charlottae propinquus* (Oustalet)

Criniger propinquus Oustalet, Nouv. Arch. Mus. [Paris], ser. 4, vol. 5, 1903, p. 76 ("Pa-Mou," Laichau Province, northwestern Tongking).

Criniger lönnbergi Gyldenstolpe, Kungl. Svenska Vet.-Akad. Handl., vol. 50, No. 8, 1913, p. 24, col. pl. 1 (Ban Huai Hom and Khao Phlung; type specimen from Ban Huai Hom, Phrae Province, northern Siam, *vide* Gyldenstolpe, Ark. för Zool., vol. 19 A, No. 1, 1926, p. 57).

Diagnosis.—Near to *M. c. aquilonis*, but distinguished by the paler and less brownish coloration of the upper parts, the rather paler olivaceous and yellow of the under parts, and the slightly paler cinnamon buff of the under tail coverts.

Wing length.—85-90 mm. (17 males), 85-90 mm. (13 females).

Specimens examined.—TONGKING: Laokay Province: Ba Nam Nhung (1 male, 1 female); Laichau Province: Muong Mo (2 males), Muong Moun (1 male, 3 females), Muong Boum (3 males, 1 female), Paham (1 female), Laichau (2 males, 1 female), 27 km. SW. of Laichau (1 male); LAOS: 5° Territoire Militaire: Bountai (2 females, 1 unsexed), Phong Saly (1 male, 1 female), Muong Yo (3 males, 3 females, 2 unsexed); BURMA: Kengtung State: Ban Sop Lao (1 male); SIAM: North: Ban Huai Mae Sai (1 male), Ban Pang An (1 male), Ban Pa Miang (1 male), Doi Chiang Dao (1 male, 1 female), Doi Suthep (5 males, 3 females), Doi Ang Ka (1 male), Doi Khun Tan (3 males, 3 females), Doi Nang Kao (1 male), Chiang Saen (1 female), Muang Lom Sak (2 males); Southeast: Rayong (1 male), Bau Hup Bon (1 female).

Remarks.—The two specimens from southeastern Siam (A.N.S.P. No. 124190 and U.S.N.M. No. 330454) were respectively taken on October 15 and November 5; they represent, in my opinion, winter wanderers.

Birds from northwestern Tongking, virtual topotypes of *propinquus*, are, with three exceptions, quite distinct from *aquilonis*; these anomalous specimens somewhat approach *aquilonis* in depth of coloration and may be winter wanderers of an intergradient population.

I cannot separate 24 examples of "*lönnbergi*" from the 15 virtual topotypes of *propinquus* by any character whatsoever.

3. *Microscelis charlottae simulator*, subsp. nov.

Type.—U. S. National Museum No. 330453, adult female, collected at Ban Hup Bon (lat. 13°05' N., long. 101°05' E.), Rayong Province, southeastern Siam, on November 3, 1931, by Hugh M. Smith (original number 5106).

Diagnosis.—Similar to *M. c. propinquus*, but distinguishable by lesser size and, in series, by having the olive of the upper parts very slightly lighter and grayer and the yellow of the under parts very slightly paler.

Wing length.—82-86 mm. (22 males), 76-83 mm. (11 females).

Specimens examined.—LAOS: Saravane Province: Thateng (1 male), Phu Tongtul (2 males, 1 female), Phu Kongtul (1 male); Paksé Province: Paksé (3 males, 4 females); SIAM: East: Sathani Hin Lap (4 males, 1 female), Ban Sa Kao (1 male), Nakhon Nayok (1 female);

Southeast: Rayong (1 male), Ban Hup Bon (1 female), Chanthaburi (3 males), Khao Soi Dao (2 females), Khao Sa Bap (3 males, 3 females, 1 unsexed), Ban Bang Phra (3 males), Khao Saming (2 males, 1 female).

Remarks.—Three January specimens from Ban Chanuman (lat. $16^{\circ}15'$ N., long., $105^{\circ}00'$ E.), with wing length 85 mm., are rather more deeply colored than average *simulator*; they should perhaps be considered *simulator* $><$ *propinquus*.

4. *Microscelis charlottae innectens*, subsp. nov.

Type.—U. S. National Museum No. 332438, adult (unsexed), collected in the Arboretum at Trangbom (lat. $10^{\circ}56'$ N., long $107^{\circ}00'$ E.), Bienhoa Province, Cochinchine, on August 7, 1932, by A. Poilane (original number 38).

Diagnosis.—*M. c. innectens* is separable from other Indo-Chinese races by its brownish-olive upper parts (duller than in *aquilonis*, browner than in *propinquus* or *simulator*) and by its more grayish, less yellow, under parts.

From topotypical *cinnamomeoventris* (southern Tenasserim), with which it agrees closely above, it differs by its shorter and less robust bill, the rather stronger yellowish wash over the under parts, and its cinnamon-buff, not ochraceous, under tail coverts.

Wing length.—Unknown (all specimens in molt).

Specimens examined.—COCHINCHINE: Bienhoa Province: Trangbom (3 unsexed).

5. *Microscelis charlottae* subsp.

Microscelis charlottae, in the Indo-Chinese countries, has a continuous distribution in the evergreen at feeble elevations, and its geographical variation follows a normal clinal pattern. One might therefore hypothesize the existence in southwestern Siam and the neighboring Tenasserim districts of a population intermediate between the green-backed *propinquus* of northwestern Siam and the brownish-olive-backed *cinnamomeoventris* of the northern Malay Peninsula. At Prachuap Khiri Khan (lat. $11^{\circ}50'$ N., long. $99^{\circ}50'$ E.), where a northern peninsular race would ordinarily begin to change into one of southwestern Siam, birds showing the first steps toward such intergradation do in fact occur.

A single example of *charlottae* from the Thaungya Sakan (Amherst or Thaton District, Tenasserim), whether by its provenience of by its color characters, may be assumed to represent this theoretical population. Despite the fact that the bird is old and in faded plumage (September 23, 1878), it appears to belong to a race easily distinguishable from any other, and I suggest that a series of fresh-plumaged specimens will show that it needs a particular name.

6. *Microscelis charlottae cinnamomeoventris* (Stuart Baker)

Iole virescens cinnamomeoventris Stuart Baker, Bull. Brit. Orn. Club, vol. 38, Dec. 4, 1917, p. 16 (Tenasserim Town and Bankasun; type locality here restricted to Tenasserim Town, Mergui District, Tenasserim Division, Burma).

Diagnosis.—Nearest *M. c. innectens* (Cochinchine), from which it is inseparable above, but distinguished by its longer and heavier bill, its

more grayish under parts (almost free of yellow suffusion), and its ochraceous, not cinnamon-buff, under tail coverts.

Wing length.—82-86 mm. (7 males), 78-82 mm. (3 females).

Specimens examined.—BURMA: Mergui District: Bentinck Island (1 male), Domel Island (1 male, 1 female), Sullivan Island (1 male, 1 female); SIAM: Peninsula: Ban Sichon (1 male, 1 female), Khao Nok Ra (1 male), Chong (2 males).

Remarks.—Two female specimens from Khao Luang (lat. $11^{\circ}40'$ N., long. $99^{\circ}35'$ E.), with wing length 79 and 82 mm., were collected in August and must represent the breeding population of that area. They stand very near *cinnamomeoventris* in coloration, but have a much smaller bill; I consider them intergrades between true *cinnamomeoventris* and the unnamed bird of southwestern Siam.

It has long been known that *cinnamomeoventris* and *cryptus* (see below) occur at many places together in the Siamese portion of the Malay Peninsula, and despite the great similarity of the two, there seems never to be the slightest difficulty in assigning a given specimen to one or the other form. This raises the question of whether or not we are dealing with two sympatric species.

Study of published records and the material before me shows that *cryptus* breeds at least as far north as Nakhon Si Thammarat (lat. $8^{\circ}25'$ N., long. $100^{\circ}00'$ E.) and has been taken (September 14) as far north as Ban Tha Lo (ca. lat. $9^{\circ}05'$ N., long. $99^{\circ}15'$ E.).

M. c. cinnamomeoventris, of which, excepting the aberrant examples of Khao Luang, I have no summer specimens, has been reported south of the Isthmus of Kra (lat. $10^{\circ}00'$ N.) only in winter (if two birds from Ban Sichon, at lat. $9^{\circ}00'$ N., long. $99^{\circ}55'$ E., collected as early as September 4 and 5, may be considered winter-taken!).

In short, the somewhat incomplete evidence presented by these series does not preclude the possibility that *cryptus* and *cinnamomeoventris* have distinct breeding ranges, with the latter wandering southward into the range of the former after the young are on the wing. Nevertheless, the rather striking (for this complex) differences in color and size, and the curious lack of intergradient individuals, may point to the fact that the two are indeed sympatric forms.

7. *Microscelis charlottae cryptus* (Oberholser)

I [ole]. *olivacea* Blyth, Journ. Asiat. Soc. Bengal, vol. 13, pt. 1, May 1844, p. 386 (Singapore Island, Malaya).

Iola olivacea cryta Oberholser, Proc. Biol. Soc. Washington, vol. 31, Dec. 30, 1918, p. 197 (Pulua Jimaja, Anamba Islands, South China Sea).

Diagnosis.—Near to *M. c. cinnamomeoventris*, but perfectly distinct by its dark olivaceous-brown (not brownish-olive) upper parts, its duller and paler under tail coverts, its longer wing, and its longer and heavier bill.

Wing length.—86-94 mm. (17 males), 81-85 mm. (8 females), 87-90 mm. (unsexed).

Specimens examined.—SIAM: Peninsula: Ban Tha Lo (1 male), Nakhon Si Thammarat (1 male), Khao Phanom Bencha (4 males, 1 female), Le Song Hong (3 males, 1 female), Ban Phra Muang (1 male); MALAYA: "Malacca" (3 unsexed); Pahang State: Gunong Taban (1 female); Selangor State: Rawang (1 male), Negri Sembilan

State: Bukit Tampin (1 male, 1 female); RHIO ISLANDS: Lingga Island (1 male, 1 female); SUMATRA: North: Rupert Strait (1 female), Siak River (1 male, 1 female), Indragiri River (1 male), Mandau River (1 female), Kateman River (1 female), Batang Serangan, Langkat (1 male, 1 female), Deli (1 male, 1 female), Tapanuli Bay (1 male), Tarussan Bay (1 male); BARUSSAN ISLANDS: Tana Massa Island (1 unsexed); BANKGA ISLAND: Tanjong Tedong (1 male); ANAM-BA ISLANDS: Pulau Jimaja (1 male, *type*).

Remarks.—Any slight differences that appear between the mainland and island series seem to be wholly explainable as the results of wear, age of specimens, etc., etc.

Blyth's name *olivacea* is considered preoccupied within the genus *Microscelis* by [*Hypsipetes*] *olivacea* Jardine and Selby, 1837 (*cf.* Deignan, Auk, vol. 59, 1942, p. 314).

8. *Microscelis charlottae charlottae* (Finsch)

Criniger Charlottae Finsch, Journ. für Orn., vol. 15, hft. 1, Jan. 1867, p. 19 (Borneo; type locality here restricted to Banjarmasin, southwestern Borneo).

Trichophorus brunnescens "Müll." Finsch, Journ. für Orn., vol. 15, hft. 1, Jan. 1867, p. 19 (Borneo, Sumatra). *Nomen nudum*!

Diagnosis.—This race is just separable from *cryptus* in series by the darker olivaceous brown of the upper parts and, possibly, by having the under parts suffused with a deeper, more brownish, olivaceous tinge.

Wing length.—85-88 mm. (2 males), 87-92 mm. (3 females).

Specimens examined.—SARAWAK: no definite locality (1 female), Mount Penrissen (1 female), Mount Kenepai (1 male, 1 female), Batu Sang, Baram River (1 male).

Remarks.—The measurements of wing length given above seem to indicate that some of the specimens have been erroneously sexed.

9. *Microscelis charlottae perplexus* (Riley)

Iole olivacea perplexa Riley, Journ. Washington Acad. Sci., vol. 29, No. 1, Jan. 15, 1939, p. 40 (Labuan Kelambu, eastern Borneo at lat. 1°40' N., long. 118°40' E.).

Diagnosis.—*M. c. perplexus* is a well-defined race, separable from *charlottae* by the lighter olivaceous brown of the upper parts (which are slightly paler and more olivaceous even than in *cryptus*), and from both *cryptus* and *charlottae* by having the grayish-olivaceous under parts everywhere suffused with a dull yellowish tinge (much as in *M. c. simulator*, but considerably less bright).

Wing length.—89 mm. (1 male), 86 mm. (1 female).

Specimens examined.—BORNEO: East: Labuan Kelambu (2 females), Segah River (1 male), Sibatik Island (1 female).

Remarks.—This form, with its more olivaceous upper parts and more yellowish under parts, might almost be considered a link between *M. c. charlottae* and *M. palawanensis*, but the complete lack of pure, bright yellow on the under parts causes it to look much nearer *charlottae*. Moreover, like *charlottae*, it has white irides, according to Stresemann (Temminckia, vol. 3, 1938, p. 127), who, under the name "*Iole olivacea charlottae*" has reported four males (wing length 89-92 mm.) and two females (wing length 83-84 mm.) from Peleben on the Kajan River.

III. *Microscelis palawanensis* (Tweeddale)

1. *Microscelis palawanensis* (Tweeddale)

Criniger palawanensis Tweeddale, Proc. Zool. Soc. London for 1878, pt. 3, Oct. 1878, p. 618 (Puerto Princesa, Paláwan Island, Philippine Islands).

Diagnosis.—Pointed feathers of crown light olivaceous brown; mantle brownish olive green; upper tail coverts dark rufescent brown; exposed portions of remiges and rectrices rufescent brown, edged with light olivaceous brown; lores and indistinct supercilium gray; sides of head pale olivaceous gray-brown, each feather with a whitish shaft streak; throat and upper breast ashy gray, streaked with light yellow; remaining under parts canary yellow, strongly washed with olivaceous along the flanks (which are posteriorly suffused with ochraceous); under tail coverts light yellowish buff.

Wing length.—84-85 mm. (2 males), 80 mm. (1 female).

Specimens examined.—PALAWAN: Puerto Princesa (2 males, 2 females).

Remarks.—This golden-eyed species combines characters of *viridescens* and the more greenish northern races of *charlottae*. The light shafts of the feathers of the sides of the head seem to occur in no other form discussed in these pages, and may thus be considered to have specific importance.

PROCEEDINGS
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A MISCELLANY OF NEW BIRDS FROM EASTERN
ASIA

By H. G. DEIGNAN

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Continued study of the Indo-Chinese avifauna has led me to believe that special names must be bestowed upon the several populations discussed below. For the loan of comparative material, my thanks are hereby tendered to the authorities of the American Museum of Natural History and of the Academy of Natural Sciences of Philadelphia.

I

Kinnear (Bull. Brit. Orn. Club, vol. 44, 1924, pp. 101-102) described *Tephrodornis gularis vernayi* from Ban Um Phang, southwestern Siam at lat. 15°50' N., long. 98°50' E., embracing under the new name all the populations of Burma and Siam south to the Isthmus of Kra. Later (Bull. Brit. Orn. Club, vol. 45, 1924, p. 28; *ibid.*, 1925, p. 75), pressed by Boden Kloss, he synonymized *vernayi* with *T. g. annectens* of far-southern Siam. Here the name rested until it was restored to use by the present writer (Bull. U. S. Nat. Mus. 186, 1945, pp. 282-284).

Renewed examination of the species has shown that the population of northern Siam and the Southern Shan States may no more properly be called *vernayi*, than *vernayi* itself may be called *annectens*, or *annectens* may be called *fretensis*. In order that each named portion of the cline running from Java to Nepal may have a value roughly equivalent with that of every other, it is essential that a name be found for the population in question, and I now propose to call it

Tephrodornis gularis jugans, subsp. nov.

Type.—U. S. National Museum No. 330959, adult male, collected on Doi Langka = Khao Pha Cho, northwestern Siam at lat. 19°00' N., long. 99°25' E., on November 17, 1930, by Hugh M. Smith (original number 4353).

Diagnosis.—Fresh-plumaged males of the new form are more or less exactly intermediate between similar specimens of *T. g. pelvica* (Nepal) and *T. g. vernayi* (southwestern Siam).

From the latter they are separable by having the ashy gray of the crown and nape sharply defined from the somewhat paler and more isabelline brown of the remaining upper parts, not at all suffusing the upper back.

From *pelvica* they are distinguished by the deeper tone of the gray

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head and nape, and by the darker, less isabelline, brown of the remaining upper parts.

Range.—Northern Siam; Southern Shan States.

II

The isolated population of *Tephrodornis pondiceriana* resident in the southern portions of Indochina has proved to be readily separable from *T. p. thai* of western Siam, and may be called

***Tephrodornis pondiceriana orientis*, subsp. nov.**

Type.—U. S. National Museum No. 361171, adult male, collected at Krongpha, Phanrang Province, southern Annam at lat. 11°49' N., long. 108°42' E., in November 1939, by Joseph F. Rock (original number 933).

Diagnosis.—Fresh-plumaged specimens of this race are nearest *T. p. thai*, but distinguishable by having the lores ashy, not at all nigrescent; the gray of the upper parts paler, especially on the crown and nape; the supercilium less extensive posteriorly and more ashy than white, thus less clearly demarcated from the gray of the crown; the gray wash over the under parts slightly darker and more extensive posteriorly, with the white portion of the abdomen accordingly reduced in area.

Range.—Easternmost Siam; Bas-Laos; Cambodia; Cochinchina; southern Annam.

III

Boden Kloss (Ibis, 1918, p. 198) based *Chloropsis aurifrons inornata* upon a series of four specimens from Sathani Lat Bua Khao (a railway station in eastern Siam at lat. 14°50' N., long. 101°35' E.) and two from Ko Lak = Prachuap Khiri Khan (southwestern Siam at lat. 11°50' N., long. 99°50' E.). Later (*tom. cit.*, p. 518), the type of the subspecies was stated to be "the first specimen recorded, the adult male with measurements, and was collected on 14 October, 1916."

This bird, now U. S. National Museum No. 278455, is lying before me and proves to be a merely subadult male. The characters adduced for the subspecies are *all* to be explained by the age of the specimen; while Kloss's description would fit equally well a subadult male of *any* Indo-Chinese race, it does not fit at all the fully adult birds of the type locality.

In fact, adult males of topotypical *inornata* have a very narrow and ill-defined, but nonetheless perfectly obvious, golden border to the black throat patch; in the degree of development of this character they stand in relation to *C. a. pridii* (northern Siam) exactly as *pridii* does to *C. a. aurifrons* (Cachar).

In southern Annam, however, is found a population in which, even in the oldest adults, no trace of the golden band *ever* appears; completely lacking the character, they cannot properly be embraced under a name belonging to birds in which the character is always present, however indistinctly. They may stand, therefore, as

***Chloropsis aurifrons incompta*, subsp. nov.**

Type.—U. S. National Museum No. 358924, adult male, collected on the southern slopes of the Lang Bian Plateau between Dalat and Ban

Methuot, Haut-Donai Province, southern Annam, in June 1939, by Joseph F. Rock (original number 58).

Diagnosis.—Nearest *C. a. inornata*, but separable by the complete lack, in the adult, of the golden-yellow band that, in *inornata*, separates the black throat from the green of the remaining under parts.

Range.—Bas-Laos; Cambodia; Cochinchina; southern Annam.

IV

In Bull. U. S. Nat. Mus. 186, 1945, p. 367, I identified as *Heterophasia* ("Leioptila") *annectens annectens* a series of six fresh-plumaged specimens from Doi Pha Hom Pok, a mountain on the frontier between northwestern Siam and the Southern Shan State of Muang Hang. Material lent me by the two museums mentioned in my introduction has shown that this population combines characters of the races *annectens* (Darjiling) and *saturata* (Karenni) in such a way that it may be better called

Heterophasia annectens mixta, subsp. nov.

Type.—Academy of Natural Sciences of Philadelphia No. 131171, adult male, collected on Doi Pha Hom Pok (lat. 20°05' N., long 99°10' E.), Siam-Southern Shan boundary, on January 27, 1938, by collectors for Rodolphe Meyer de Schauensee (original number 118).

Diagnosis.—The new form may be best described as having the lower back, rump, and upper tail coverts chestnut as in *saturata* (a shade paler in series), not rufous as in *annectens*, and the scapulars pale rufous as in *annectens*, not chestnut as in *saturata*.

Range.—The type locality and adjacent parts of the Southern Shan States (a Harington skin from "Pun Thabet watershed 6600 ft" belongs here).

Remarks.—Seven specimens of *H. a. mixta* have been compared with 13 of *annectens* (Sikkim, Chin Hills, Assam, northern Burma, far-western Yunnan, Kengtung State) and 24 of *saturata* (provinces of northwestern Siam adjacent to Karenni).

V

Oustalet (Bull. Soc. Philomath. Paris, ser. 7, vol. 1, No. 3, 1877, p. 139) described *Heterophasia* ("Sibia") *desgodinsi* from "Yer-ka-lo" (= Yentsing?), a settlement on the river Mekong in extreme south-western Sikang Province, China, at lat. 29°03'30" N. If, as seems certain, four specimens taken by Joseph F. Rock in the neighborhood of Tsechung, another settlement on the Mekong in northwestern Yunnan Province, at ca. lat. 28°09' N., may be held to represent true *desgodinsi*, then the population of the Likang Mountains may be treated as a distinct race, and called

Heterophasia capistrata tecta, subsp. nov.

Type.—U. S. National Museum No. 296571, adult male, collected at Nguluko (a settlement at elev. 10,000 ft. in the mountains just north of Likang), northwestern Yunnan Province, China, on April 10, 1923, by Joseph F. Rock (original number 159).

Diagnosis.—Easily distinguished from *H. c. desgodinsi* by having the ear coverts not dead black but brownish black, and by having the middle

and lower back distinctly vinaceous brown, not gray slightly suffused with vinaceous ("gris légèrement nuancé de roux," in the words of David and Oustalet, *Oiseaux de la Chine*, 1877, p. 556).

Range.—The Likiang Mountains of Yunnan Province and the immediately adjacent portions of southwestern Szechwan Province.

Remarks.—A series of nine birds from Szechwan (Yachowfu = Yaan, Mount Omei, Suifu = Ipin) agree well enough with true *desgodinsi*, of which the range probably extends right across Sikang Province and western Szechwan (excepting the extreme southwest of the latter province).

VI

Examination of Chinese series of *Passer rutilans* taken throughout the year has indicated that the population of eastern and central Szechwan Province represents a well-marked race intermediate between *P. r. rutilans* (Japan, southeastern China) and *intensior* (Yunnan, northern Burma). I intend to name it

Passer rutilans ignoratus, subsp. nov.

Type.—U. S. National Museum No. 306382, adult male, collected on Mount Omei (at elev. 4,000 ft.), Szechwan Province, China, on July 9, 1925, by David C. Graham (original number 2).

Diagnosis.—The adult male has the chestnut of the upper parts much darker and duller than in *intensior*, but of much the same tone as in *rutilans* (perhaps a little darker in series); the under parts washed with a deeper gray than in *rutilans*, as dark as in *intensior*, but, unlike those of the latter, scarcely tinged at all with pale yellow; the sides of the neck white at all seasons as in *rutilans*, not overlaid with sulphur yellow as in *intensior* at all seasons.

Range.—Szechwan, but intergrading with *intensior* in the far west, southwest, and south.

Remarks.—Thirteen adult males of *ignoratus* have been compared with 13 of *intensior* and 23 of *rutilans*. Specimens placed with the new form have been seen from Suifu, Mount Omei, Gonghsien, Wenchuan, Washan, Wanhsien, and Chengtu.

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ANOTHER NEW *PLECTROHYLA* FROM GUATEMALA

By L. C. STUART

During the course of pursuing herpetological investigations in the mountains of northwestern Guatemala, I collected, on the crest of the Sierra Madre, a very distinct new species of *Plectrohyla*. For its geographic locale I name this new form

Plectrohyla cotzicensis new species

Holotype.—University of Michigan, Museum of Zoology (U.M.M.Z.) No. 95902. An adult male collected April 23, 1942 by L. C. Stuart.

Type locality.—Source of the Rio Cuileco on the slopes of Cerro Cotzie about 2 kilometers northwest of Ixchiguan, Department of San Marcos, Guatemala. Elevation, about 3500 meters.

Paratypes.—Five specimens, U.M.M.Z. Nos. 95903-07, collected with the holotype.

Diagnosis.—A *Plectrohyla* readily distinguishable from all other species of the genus by the possession of an outer tarsal ridge.

Description of holotype.—Teeth prominent, 30 on the maxilla and premaxilla; vomarines in 2 series with 2 teeth in each series, situated between the choanae. Tongue large and almost circular, slightly notched posteriorly.

Head short. Mouth rounded in outline. Rostrum sharply pointed above mouth. Canthus conspicuous, marked by a low ridge. Tympanum barely indicated. A heavy fold extending from posterior corner of eye, above tympanic region and curving downward towards arm insertion. Skin of upper surface, except thighs, strongly but finely tuberculate especially upon the head. Under surfaces except lower legs and feet, heavily and coarsely tuberculate. A fold from the mouth angles extends across the ventrum anterior of the chest.

Legs normally developed, slightly shorter than head-body length. Feet with well-developed webs which leave the last phalange of each digit free except on the inner sides of II, III and V on which the web extends to the terminal disks. Webs incised to penultimate-ultimate joint between digits I-II, II-III, and III-IV and to middle of ultimate phalange between IV-V. Terminal disks well-developed but smaller than those on the hands. A large inner metatarsal tubercle from which a fold of skin extends along the tarsus to the heel. Another fold of skin extending along the tarsus from the base of digit V to the heel.

Arms heavy; a ridge of tubercles extending along fore-arm from the base of the hand to the elbow. Digit I with a simple (catalagenous?) pre-pollex. Outer edge of pre-pollex and pollex conspicuously pigmented. All digits with but the vestiges of webbing. Terminal disks well-developed.

Head-body length, 45 mm.; leg to heel, 36 mm.; foot to tip of digit IV, 34 mm.

In alcohol the upper surfaces are gray, mottled with black; under-surfaces immaculate except throat which is slightly mottled with gray. In life the specimen was bright green above, mottled with brown. The legs were reddish-brown below, the belly a dirty white, and the chin mottled with brown.

Variation.—The five paratypes and a juvenile (U.M.M.Z. 95908) show little variation aside from color. A male (U.M.M.Z. 95905) which was dissected revealed the absence of the quadrate-jugal, a vocal sac and even vocal sac openings. Maxillary teeth in the type series varied 26-30, thus indicating that the species possesses fewer maxillary teeth than any other members of the genus. In all specimens, even the juvenile, the diagnostic outer tarsal fold or ridge is prominent. As a group the rostrum of this species is more pointed, the canthus best defined, and the dorsum more tuberculate than any other members of the genus. The swollen fore-legs are characteristic of breeding males only.

Variation in the pattern in life was considerable. Three specimens were colored as described in the holotype. Three others were bright green above, unmottled, and with a dark streak extending from the nostril, above the eye, to the shoulder. From there it extended on to the thigh in one specimen and broke up into mottlings on the sides in another. One specimen was pale green below.

The juvenile possessed a pattern quite different from that of the adults. Above it was bright green. The lateral dark stripe was sharply demarked. The outer tarsal fold was white and there was, in addition, a white carpal streak. The undersurfaces were lemon yellow. This stripped pattern was not greatly different from that of the juvenile pattern, of *P. ixil*.¹

The tadpoles, to be described at a later date, are of the general type of "form b" of Hartweg and Orton² and of "form z" of Stuart.³

Habits and Habitat.—All the specimens of this species were secured from beneath rocks and clumps of sod in shallow tricklets emerging from springs on the flanks of Cerro Cotzic. This region was a marshy area with short-grass cover in the midst of the *pajon* (bunchgrass) covered slopes. The water temperature here was approximately 12°C. A female, collected with the holotype, was filled with large eggs ready for deposition.

The occurrence of *Plectrohyla cotzicensis* at high elevations in the Sierra Madre is somewhat surprising. Aside from the type locality, the only other record of the species is based upon tadpoles secured at 3100 meters several kilometers east of Ixchiguan. At lower elevations (2500 meters) on the flanks of the Sierra Madre *Plectrohyla guatemalensis* completely surrounds *P. cotzicensis*. It may be that this latter, like *Oedipus rostratus* and *Oedipus rex* is discontinuously distributed along the crests of the higher ranges that surmount the Guatemalan Plateau west and north of Guatemala City.

¹Stuart, L. C., "Descriptions of Two New Species of *Plectrohyla* Brocchi With Comments on Several Forms of Tadpoles." Occ. Pap. Mus. Zool., Univ. Michigan, 455, 1942: 13.

²Hartweg, Norman and Orton, Grace, "Notes on Tadpoles of the Genus *Plectrohyla*." Occ. Pap. Mus. Zool., Univ. Michigan, 438, 1941: 5-6.

³Stuart, L. C., *op. cit.*, 10-11, Fig. 4.

PROCEEDINGS
OF THE
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SYSTEMATICS OF THE WHITE-CROWNED SPARROW

By W. E. CLYDE TODD

Until a study made some years ago (Taverner and Sutton, Annals Carnegie Museum, 23, 1934, 77) disclosed that the prevailing form of the White-crowned Sparrow (*Zonotrichia leucophrys*) at Churchill was *gambelii* and not *leucophrys* (as these forms are currently understood), there had never been any serious question as to the application of these names. But now there arose an even chance that birds of the *gambelii* type might range farther south along the west coast of Hudson Bay, in which case the specific name might be involved. It so happens that the *Emberiza leucophrys* of Forster (Philosophical Transactions, 62, 1772, 403, 426) was described from two specimens, taken respectively at Severn River and Albany Fort, Hudson Bay. In the latest edition of the A.O.U. Check-List the type-locality is definitely restricted to the first-named of these. If this designation is accepted, a regrettable shift in names becomes necessary. Through the courtesy of the authorities of the Royal Ontario Museum of Zoology of Toronto, Ontario, I have lately been permitted to examine an enlightening series of thirteen White-crowned Sparrows from Fort Severn, collected by Mr. C. E. Hope a few years ago. All but two (or perhaps three) specimens are definitely of the *gambelii* type, with the white superciliaries continued to the bill, and even the exceptions are more or less intermediate.

This being the case, the only possible way to conserve Forster's name for the Eastern White-crowned Sparrow might be to change the type-locality to Albany. However, we do not yet know which form occurs there. Forster's statement (at second hand) that the bird breeds at this place requires confirmation. The White-crowned Sparrow must pass through Albany in migration, but it is unlikely, in my opinion, that it would breed there when it does not breed at the same latitude on the east coast of James Bay. It may be that Forster's informants confused this species with the White-throated Sparrow, *Zonotrichia albicollis*, when it came to breeding birds. So far as I am aware Forster's type-specimens have dropped out of sight, and his Latin description does not point unmistakably, or with absolute certainty, to which form of the White-crowned Sparrow he had in hand. I translate the pertinent

clauses thus: "then black bowed (lines), from the angle of the eyes, almost coming together on the nape." Obviously, this refers to the postocular black stripe, since he has already noted the lateral coronal black stripes. Had he been describing the eastern race he would have said (presumably) "arcus dein atri per oculos," etc. The very fact that he writes "ex angulis oculorum" instead indicates to my mind that the black stripe he was describing began behind the eye and not at the bill. If, therefore, we rule out a change in the type-locality we are justified, so I believe, in proceeding on the basis of the evidence we have as to the form prevailing at Fort Severn. Unfortunate nomenclatural complications thereupon ensue.

Zonotrichia leucophrys leucophrys (Forster) will have to be transferred to Gambel's Sparrow, and *Zonotrichia leucophrys gambelii* (Nuttall) becomes a synonym of the other. For the Eastern White-crowned Sparrow another name must be found. Ridgway (Bulletin U. S. National Museum No. 50, Part 1, 1901, 339) cites the *Spizella maxima* of Bonaparte, Compt. Rend., 37, 1853, 922, note, from Mexico, as a doubtful synonym in this connection. Mr. A. J. van Rossem had occasion a few years ago to examine the type-specimen of this name. He writes as follows: "The type of Bonaparte's *Spizella maxima*, which is 7329e in the Brussels Museum, is a first winter example of *Zonotrichia leucophrys gambelii*, or as I have always maintained *Zonotrichia gambelii gambelii*. Fortunately, no name changing is involved in this case. So far as I can determine the writing on the label is that of Bonaparte himself. There is no indication of where the bird was obtained other than 'Mexique,' nor from whom the Brussels Museum purchased it." Under the circumstances I feel that the Eastern White-crowned Sparrow is worthy of a new name and a definite type. I would propose

Zonotrichia leucophrys nigrilora, subsp. nov.

Type.—No. 102,527, Collection Carnegie Museum, adult male; Point Natashquan, Quebec, June 1, 1928; George M. Sutton.

Subspecific characters.—Similar to *Zonotrichia leucophrys leucophrys* (Forster) of the region between Hudson Bay and the Pacific coast, but whitish superciliary stripe ending just above the anterior end of the eyelid, thus leaving the upper part of the lores black, continuous with the lateral coronal stripe; bill (in life) more deeply colored.

While I am provisionally describing this form as a subspecies, I am by no means convinced that it is conspecific with Gambel's Sparrow; there is indeed considerable evidence to the contrary. However, it is certainly thus related to *Zonotrichia leucophrys oriantha* Oberholser of the Warner Mountains, Oregon, with which form it has been directly compared. If it is actually specifically separable from the white-browed form it would have to stand as *Zonotrichia oriantha nigrilora*.

The present case is a shining example of the stability of English names as against technical names in our present system of nomenclature.

PROCEEDINGS
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HOFFMANIA, A NEW SUBGENUS IN *CULICOIDES*
(DIPTERA: CERATOPOGONIDAE)

By IRVING FOX

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There is a group of species in *Culicoides* whose members differ so much from the others in the genus as to be worthy of nomenclatorial recognition, and herein a subgeneric name is provided for it. In the Western Hemisphere 12 species of this new subgenus are known to occur, and a key is given to these species together with the synonymy, distributional notes and comments on diagnostic features.

Culicoides Latreille **Hoffmania**, new subgenus

Female with eyes contiguous in the median line and with the second radial cell of the wing included in a light spot. Male hypopygium as follows: ninth tergite rounded with the apico-lateral processes small or absent; inner process of sidepiece absent; aedagus more or less triangular basally with a ventral marginal band and, distally with a dorsal "peg" having a ball-like tip; harpes approximate or even fused basally. Type.—*Culicoides inamollae* Fox and Hoffman.

Key to the American species of *Hoffmania* n. subg. (females only)

1. Third palpal segment with a prominent sensory pit or vestiges of one 5
 Third palpal segment without a sensory pit 2
2. Legs banded conspicuously; length, 2.00 mm. or more *heliconiae*
 Legs uniform light yellowish; length, 1.75 or less 3
3. Light double spot on vein M_2 not distinct *oliveri*
 Light double spot on vein M_2 distinct 4
4. Cross vein dark at junction with the media and junction with the radius *maruim*
 Cross vein dark only at junction with the radius *trinidadensis*
5. A prominent dark spot on cross vein 6
 No prominent dark spot on the cross vein 10
6. Two white spots in cell M_1 beyond the double spot 7
 Only one white spot in cell M_1 beyond the double spot 8
7. Mesonotum with a pattern of large dark markings; wing about 1.00 mm. long *diabolicus*
 Mesonotum without a distinct pattern; wing about 1.40 mm. long *guttatus*

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- | | |
|--|--------------------|
| 8. Mesonotum with three dark bands in the form of an "m" closed in front | <i>insignis</i> |
| Mesonotum without a definite pattern | 9 |
| 9. Tibiae dark with subbasal light annulations..... | <i>inamollae</i> |
| Tibiae uniform light yellow | <i>painteri</i> |
| 10. Mesonotum with a median dark triangular spot at the anterior border | <i>venustus</i> |
| Mesonotum without such a spot | 11 |
| 11. With two light spots in cell M ₁ beyond the double spot..... | <i>diabolicus</i> |
| With one light spot in cell M ₁ beyond the double spot..... | 12 |
| 12. Third palpal segment with a distinct circular pit | <i>flavivenula</i> |
| Third palpal segment with the sensory pit not distinctly circular | <i>lutzi</i> |

Culicoides (H.) *heliconiae* Fox & Hoffman

Fig. 1

1942. *Culicoides* species (3) Fox, Puerto Rico Jour. Pub. Health and Trop. Med. 17:418, Figs. 19 and 24. (Venezuela: Maracay)
1944. *Culicoides heliconiae* Fox & Hoffman, Puerto Rico Jour. Pub. Health and Trop. Med. 20:108, Fig. 1.
1945. *Culicoides heliconiae* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 6:43.
1946. *Culicoides heliconiae* Fox, Ent. Soc. Amer. Ann. 39:256.

Records.—Trinidad: Cumuto Village, August 7, 1941 on wall of stable, one female. Honduras: Tela, July, 1924, from a water holding plant, two male pupae.

Remarks.—The female of this species may be recognized by the following features: (1) the absence of a palpal sensory pit, (2) its large size, (3) the banded legs, (4) the mesonotal pattern of large brown markings and (5) the presence of a more or less oval light spot on vein M₁ near the cross vein. The hypopygium is unique in that the harpes are united below the long acuminate ends forming a main body (Fig. 1). A statement in the original description of the adult that the eyes are separated is erroneous, they are contiguous.

Culicoides (H.) *maruim* Lutz

Fig. 3

1913. *Culicoides maruim* Lutz, Inst. Oswaldo Cruz. Mem. 5:48, Pl. 7, Fig. 1; Pl. 8, Fig. 19. (Brazil: Estados Rio de Janeiro e São Paulo. Trinidad.)
1937. *Culicoides maruim* Da Costa Lima, Inst. Oswaldo Cruz Mem. 32: 412.
1945. *Culicoides maruim* Vargas, Inst. Sal. y Enferm. Trop. Rev. 6:43.
- Record*.—Brazil: Itapagipe, suburb of San Salvador, Bahia, August 16-18, 1933, several males and females collected by N. C. Davis.

Remarks.—In addition to the absence of a palpal sensory pit, two other outstanding characters distinguish this species—the yellowish brown unbanded legs and the absence of a distinct pattern on the mesonotum. The hypopygium is recognizable particularly by the somewhat massive character of the aedagus (Fig. 3).

Culicoides (H.) *trinidadensis* Hoffman

Fig. 4

1925. *Culicoides trinidadensis* Hoffman, Amer. Jour. Hyg. 5:286, Pl. II, Fig. 6 (Trinidad: Port of Spain)
1937. *Culicoides trinidadensis* Macfie, Ann. and Mag. Nat. Hist. 20:9.
1937. *Culicoides trinidadensis* Da Costa Lima, Inst. Oswaldo Cruz Mem. 32:415.
1943. *Culicoides trinidadensis* Johannsen, Ent. Soc. Amer. Ann. 36:780.
1945. *Culicoides trinidadensis* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 6:43.
1946. *Culicoides trinidadensis* Fox, Ent. Soc. Amer. Ann. 39:256 (Trinidad: Stubal's Bay).

Remarks.—The single female specimen upon which the description of this species was based is not available; but it is believed that the material from Stubal's Bay is correctly identified as Hoffman's species. In these specimens the legs, mesonotum, palpi and wings are very similar to those of *marum*, which Lutz recorded from Trinidad, and indeed little of importance can be found to separate the two species, the character given in the key being admittedly trivial. They are maintained separate, however, because the male of *trinidadensis* has not yet been found and resolution of the problem of identity should await its discovery. Dr. Costa Lima has indicated that *trinidadensis* is a synonym of *insignis* and Dr. Macfie considers it to be a synonym of this species or *guttatus*. These distinguished authors base their opinion on the wings alone; but in both *insignis* and *guttatus* there is a palpal sensory pit and the legs are banded.

Culicoides (H.) *oliveri* Fox and Hoffman

1944. *Culicoides oliveri* Fox and Hoffman, Puerto Rico Jour. Pub. Health and Trop. Med. 20:108, Fig. 5 (Haiti: Mariani and Bayeux).
1945. *Culicoides oliveri* Vargas, Inst. de Sal. y Enferm. Trop. 6:43.
1946. *Culicoides oliveri* Fox, Ent. Soc. Amer. Ann. 39:255, Fig. 4.

Remarks.—The poor condition of the type material does not permit an exact appraisal of this species. Although the palpi are broken off, it is placed near *marum* in the key because of the wings and legs of the female which are similar to those of that species. The hypopygium according to the allotype, is very close to that of *inamollae*, which leads to the suspicion that the sexes have not been properly matched. The status of this species will remain unsatisfactory until more material is obtained from the type localities.

Culicoides (H.) *guttatus* (Coquillett)

Fig. 2

1904. *Ceratopogon guttatus* Coquillett, N. Y. Ent. Soc. Jour. 12:35 (Brazil: São Paulo).
1913. *Culicoides guttatus* Lutz, Inst. Oswaldo Cruz Mem. 5:58 (Brazil: Rio de Janeiro, Xerém, Bonito).
1932. *Culicoides guttatus* Macfie, Ann. and Mag. Nat. Hist. 10:488 (Colombia)
1935. *Culicoides guttatus* and *Culicoides* (?) *diabolicus* Macfie, Stylops 4:54 (Brazil: Piauí, Tutoia)

1937. *Culicoides guttatus* Macfie, Ann. and Mag. Nat. Hist. 20:8.
 1937. *Culicoides guttatus* Da Costa Lima, Inst. Oswaldo Cruz Mem. 32:415, Fig. 1
 1938. *Culicoides guttatus* Macfie, Roy. Ent. Soc., London Proc. Ser. B., 7:164 (Trinidad: St. Augustine, Noriva Ferry)
 1939. *Culicoides guttatus* Macfie, Rev. de Ent. 10:199 (Brazil: Nova Teutonia)
 1939. *Culicoides guttatus* Adamson, Trop. Agr. (Trinidad) 16:81
 1940. *Culicoides guttatus* Macfie, Roy. Ent. Soc. London Proc. Ser. B., 9:185 (British Guiana: Mazaruni)
 1944. *Culicoides guttatus* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 5:165.
 1945. *Culicoides guttatus* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 6:43.

Records.—Brazil: Porto das Caixas, March 3, 1925, female collected by N. C. Davis; Bahia, Piraya, March 8, 1933, female collected by N. C. Davis. Venezuela: Ocumare, female.

Remarks.—An outstanding character which seems to distinguish this species is the presence of a small isolated dark spot near the tip of vein R_{4+5} . Other features of the female are: (1) the size of the wing—1.47 by .60 mm. in a cotype, (2) a dark spot on the cross vein, (3) two light spots in cell M_1 beyond the double spot, (4) no distinct mesonotal pattern of large dark markings, (4) palpus provided with a sensory pit and with the fourth segment longer than the fifth (Fig. 2) and (6) the banded legs. The hypopygium has not been described, and the characteristics of the female mesonotum are not well known.

Culicoides (H.) *diabolicus* Hoffman

Fig. 5

1925. *Culicoides diabolicus* Hoffman, Amer. Jour. Hyg. 5:294, Pl. I, Fig. 7, Pl. II, Fig. 12, (Panama: Cabima).
 1932. *Culicoides diabolicus* Macfie, Ann. and Mag. Nat. Hist. 9:487 (Colombia)
 1936. *Culicoides species* Dampf, Medicina (Mexico) 16:228, Fig. 1 (Mexico: Chiapas, El Vergel)
 1937. *Culicoides guttatus* var. *diabolicus* Macfie, Ann. and Mag. Nat. Hist. 20:7 (Trinidad: Nariva River; Montserrat Distr.; St. Augustine)
 1937. *Culicoides diabolicus* Da Costa Lima, Inst. Oswaldo Cruz 32:415, Fig. 5 (Brazil: Pará, Rio Aramakiry Grande).
 1939. *Culicoides diabolicus* Adamson, Trop. Agr. (Trinidad) 16:81 (Trinidad: Caura Valley, Sangre Grande; The Montserrat District)
 1939. *Culicoides flariferus* Hoffman, Puerto Rico Jour. Pub. Health and Trop. Med. 15:172-174, Figs. 1, 2, 3.
 1940. *Culicoides guttatus* (*C. diabolicus* Hoff.) Macfie, Ent. Monthly Mag. 76:25 (British Guiana: New River)
 1943. *Culicoides diabolicus*, *flariferus* Johannsen, Ent. Soc. Amer. Ann. 36:779.
 1944. *Culicoides diabolicus* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 5:163-169, Pl. I, Figs. 3 and 4, Pl. II, Figs. 1-8 (Mexico: Chiapas, Mariscal, Santa Julia y Esperanza).

1945. *Culicoides diabolicus* Vargas, Inst. de Sal y Enferm. Trop. Rev. 6:43.

1946. *Culicoides pseudodiabolicus* Fox, Ent. Soc. Amer. Ann. 39:256, Fig. 1 (Trinidad: Cumuto Village).

Records.—Panama: Canal Zone, Balboa, July 2, 1942, light, No. 1024, two males and three females collected by Dr. P. A. Woke.

Remarks.—This species is similar to *guttatus* but differs particularly in the size of the wing and in the possession of a mesonotal pattern consisting of large dark markings. Certain specimens show a darkening of the cross vein, hence its inclusion in two places in the key; but what are regarded as typical examples have both the cross vein and vein R_{4+5} light. The hypopygium is characterized by having the harpes broadly united basally (Fig. 5). Dr. Macfie believes *diabolicus* to be a variety of *guttatus*, but both Dr. Costa Lima and Dr. Vargas separate the two species on the basis of wing size.

Culicoides (H.) *insignis* Lutz

1913. *Culicoides insignis* Lutz, Inst. Oswaldo Cruz Mem. 5:51, Pl. 7, fig. 3 (Brazil: Rio de Janeiro)

1913. *Culicoides guttatus* Lutz, Inst. Oswaldo Cruz Mem. 5:58 (in part), Pl. 7, fig. 7 (not *guttatus* Coq.)

1937. *Culicoides insignis* Da Costa Lima, Inst. Oswaldo Cruz Mem. 32:415, Figs. 2 and 3.

1945. *Culicoides insignis* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 6:43.

Remarks.—The following features distinguish the female of this species: (1) mesonotum with a definite pattern consisting of three dark bands forming an "M" closed in front, (2) the large size, slightly less than 2.00 mm. with wings 1.50 mm. long, (3) the third palpal segment markedly swollen but the sensory pit vestigial consisting of not well defined depressions (see Da Costa Lima's figures), (4) the banded legs, (5) the cross vein with a dark spot and vein R_{4+5} dark to near the tip extending well into the white spot on the second radial cell and (6) only one white spot in cell M_1 beyond the double spot. The male hypopygium has not been described.

Culicoides (H.) *inamollae* Fox and Hoffman

Fig. 6

1944. *Culicoides inamollae* Fox and Hoffman, Puerto Rico Jour. Pub. Health and Trop. Med. 20:110, Fig. 2 (Puerto Rico: Mayaguez).

1945. *Culicoides inamollae* Vargas, Inst. de Sal y Enferm. Trop. Rev. 6:43.

1946. *Culicoides inamollae* Fox, Ent. Soc. Amer. Ann. 39:257.

Records.—Florida: Collier Co., Immokalee, November 1, 1946, at light, collected by M. S. Whisnant, several males and females received through the courtesy of Capt. D. C. Thurman, U.S.P.H.S.; Miami, 1943-44, two females, at light, received through the courtesy of Capt. Willis Wirth, U.S.P.H.S.

Remarks.—This species is similar to *insignis* in the arrangement of light and dark spots of the wing, the palpus and the legs. It differs, however, in not having the mesonotal design described for that species and in being smaller in size. The total length of *inamollae*, female, is not

more than 1.4 mm. as compared with the "a little less than 2 mm." of *insignis*; the wing in *inamollae* is about 1.1 mm. long while in *insignis* it is 1.5 mm., according to the original description. The hypopygium is characterized by having the harpes separated to their bases and these joined by a peculiar loop (Fig. 6).

Culicoides (H.) *painteri* Fox

Fig. 7

1946. *Culicoides painteri* Fox, Ent. Soc. Amer. Ann. 39:257, Fig. 10 (Honduras: Puerto Castilla)

Remarks.—This species is very close to *inamollae* and may in fact be identical with it. Minor differences in structure as well as the distantly separated type localities urge that the two be maintained apart until more material from Honduras is available. In the specimens at hand the legs are uniform and the palpus and hypopygium show minor differences which, if constant, would permit the retention of this species.

Culicoides (H.) *flavivenula* Lutz

1937. *Culicoides flavivenula* Lutz, Inst. Oswaldo Cruz Mem. 32:418, Fig. 4 (Brazil: Bahia, Japahyba, Augra dos Reis; Rio de Janeiro, Mangueinhos).

1945. *Culicoides flavivenula* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 6:43

Remarks.—This species is similar to *insignis* from which it differs in not having a dark spot on the cross vein and not having vein R_{4+5} dark to near the tip as well as in the structure of the palpus, which is illustrated in the original description. The male has not been described.

Culicoides (H.) *lutzi* Da Costa Lima

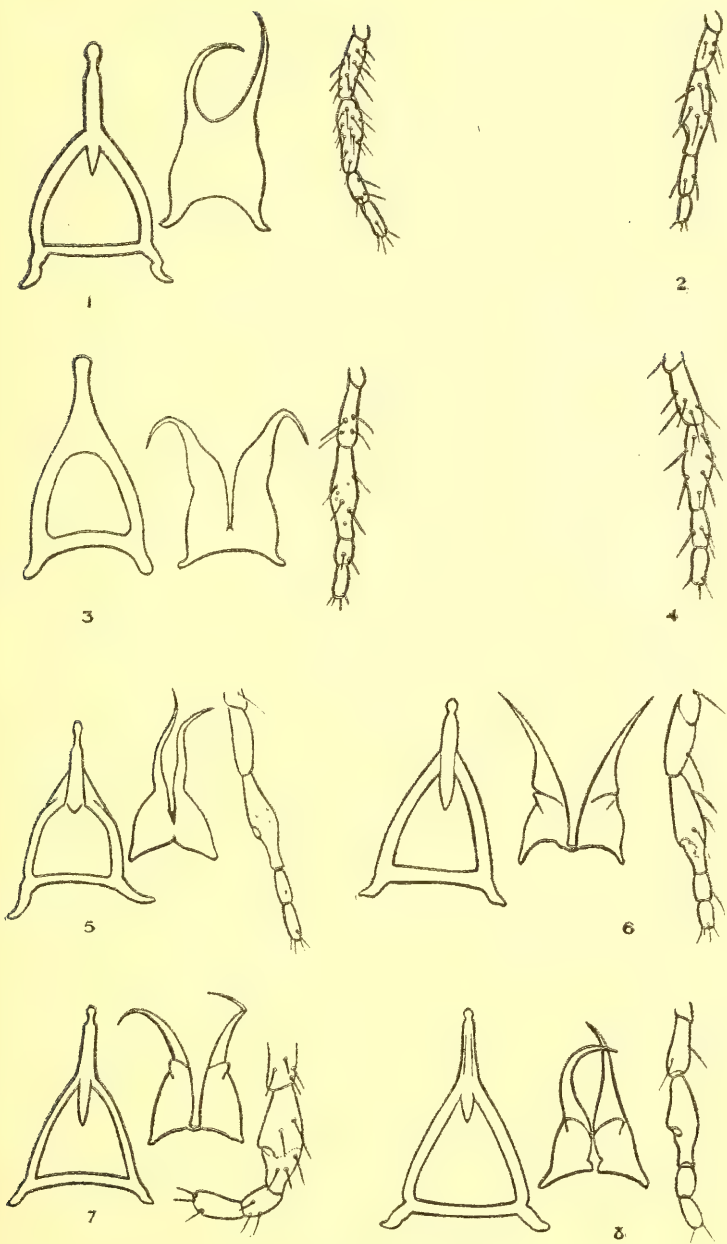
1937. *Culicoides lutzi* Da Costa Lima, Inst. Oswaldo Cruz Mem. 32:419, Fig. 5 (Brazil: Para, Abaete).

1945. *Culicoides lutzi* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 6:43.

Remarks.—This species is similar to *flavivenula* Lutz from which it

Explanation of Plate I

- Fig. 1. *Culicoides* (H.) *heliconiae* Fox and Hoffman, aedagus, harpes and female palpus.
 Fig. 2. *Culicoides* (H.) *guttatus* (Coq.) female palpus.
 Fig. 3. *Culicoides* (H.) *marum* Lutz, aedagus, harpes and female palpus.
 Fig. 4. *Culicoides* (H.) *trinidadensis* Hoffman, female palpus.
 Fig. 5. *Culicoides* (H.) *diabolicus* Hoffman, aedagus, harpes and female palpus.
 Fig. 6. *Culicoides* (H.) *inamollae* Fox and Hoffman, aedagus, harpes and female palpus.
 Fig. 7. *Culicoides* (H.) *painteri* Fox, aedagus, harpes and female palpus.
 Fig. 8. *Culicoides* (H.) *venustus* Hoffman, aedagus, harpes and female palpus.



differs in the mesonotal pattern and in the structure of the palpus, illustrated in the original description. The male has not been described.

Culicoides (H.) *venustus* Hoffman

Fig. 8

- 1925. *Culicoides venustus* Hoffman, Amer. Jour. Hyg. 5:290, Pl. I, Fig. 4, Pl. II, Fig. 9 (Maryland: Baltimore)
- 1937. *Culicoides venustus* Root and Hoffman, Amer. Journ. Hyg. 25:155, Pl. I, Fig. 2 (New York, Connecticut: East Haddam).
- 1943. *Culicoides venustus* Johannsen, Ent. Soc. Amer. Ann. 36:780.
- 1945. *Culicoides venustus* Vargas, Inst. de Sal. y Enferm. Trop. Rev. 6:43.

Remarks.—The female of this species is characterized by the following distinctive features: (1) the large size—1.9 mm. long with a wing length of 1.5 mm. (2) the third palpal segment slightly swollen with a not particularly prominent sensory pit (3) the distinctive mesonotal pattern as described and illustrated by Hoffman and (4) the banded legs. There may be two light spots near the tip of cell *M*₁ beyond the double spot or only one. The hypopygium (Fig. 8) is unique in that the harpes although approximate are not united as in all the other species treated in this paper.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THE SEXUAL FORMS OF SOME
SPECIES OF APHIIDAE

By F. C. HOTTES

Here follow the descriptions of the sexual forms of some of the aphid species described by the author in the Proceedings of the Biological Society of Washington, Vol. 46, pp. 1-24.

Macrosiphum nivanista (Hottes)

Oviparous female.

Size and general color.—Average length from vertex to tip of anal plate 2.49. Individual specimens range from 2.39-2.55. Average width across the eyes .590. Head thorax and abdomen milk-white to cream in color. The white in this case is not due to pulverulent matter, in fact no pulverulence was noted on viviparous females taken during the summer of 1947. The following structures depart from the general body color: the apical portions of antennal segments III, IV and V and all of VI which are light dusky; the eyes, the apical portion of the rostrum, and the apical portion of the tibia are also dusky. The tarsi are dark brown to almost black and are very conspicuous, because of their sharp contrast with the rest of the body. The extreme tips of the cornicles are light dusky but at times this statement applies only to the rim of the cornicles.

Head and appendages.—The antennal segments have the following proportional lengths: III .528-.614 ave. .556, IV .614-.771 ave. .662, V .585-.642 ave. .610, VI .199-.285 ave. .239 + 1.21 —1.35. It will be noted that as in the viviparous females the fourth segment is longer than the third an unusual condition and that the fifth segment is also longer than the third, a condition which is rare enough to be noteworthy. There are no secondary sensoria. The antennal hair are sparse and about one half the width of the segment in length. The third and fourth antennal segments are lightly imbricated the fifth and sixth more so. The rostrum reaches the coxae of the metathoracic pair of legs.

The Thorax.—The hind tibiae are 2.12 long. The hind tarsi are .228 long. The sensoria on the hind tibiae are very small and for the most part round, they occupy the proximal third of the segment which is very little swollen. The tibial hair are sparse and very evenly spaced and rather coarse. In length these hair are about one half the width of the tibia and like all other hair found on this species sharp pointed.

Abdomen.—The cornicles are from .314-.371 long and average .357. The cauda is from .214-.257 long and has from three to four hair on a side. Its surface is very finely setulose.

Morphotype.—Oviparous female. Data associated with morphotype:

taken on *Mertensia sibirica*, Skyway, Colorado, Oct. 8, 1947. Deposited in the United States National Museum.

A few specimens of this species were taken on *Polygonatum commutatum* during the past summer. This represents a new host for the species.

Macrosiphum katonkae (Hottes)

Apterous male.

Size and general color.—Average length from vertex to tip of anal plate, 1.927. Head green with dusky brown on antennal tubercles and vertex. Thorax and abdomen dark green. First and second antennal segments dusky green. Base of third antennal segment dusky remainder of segment brown. Fourth, fifth and sixth antennal segments uniform brown. Femora of all legs greenish at base shading to brown with a tinge of green. Tibiae brown with apical portions darker. Cornicles dusky brown. Anal plate green with dusky markings. Cauda green with dusky margins, setulose surface brown. Gonapophyses dark brown.

Head and appendages.—Antennal segments with the following comparative lengths: III—.885, IV—.714, V—.614, VI—.171 +1.170. Secondary sensoria distributed as follows: III—39 irregularly arranged but more numerous on one side of segment and extending throughout the length of segment. IV—18. On this segment the sensoria are small, arranged in more or less of a regular row and extend throughout the length of the segment. V—The sensoria on this segment are limited to the apical two thirds of the segment, they are arranged in more or less of a regular row and number 16. Beak green with segments IV and V dusky, it extends just beyond the base of the coxae of the metathoracic pair of legs.

Thorax and appendages.—The male of this species is apterous. Hind tibiae 1.756. Hind tarsi .171.

Abdomen.—Cornicles .642 imbricated and reticulated as in viviparous females, not as sturdy or as outwardly curved as in females. Gonapophyses finger-like with numerous hair. Cauda .285 not constricted, with three hair on a side.

Oviparous female.

Length from vertex to tip of anal plate 2.427-2.784. Width across eyes .571. Color similar to that of apterous viviparous female. Antennae with the following proportional lengths III—.956, IV—.698, V—.642, VI—.171 +1.071. Secondary sensoria confined to the third antennal segment, numbering from 13-16. The sensoria vary greatly in size and shape and are limited to the basal half of the segment. The beak extends beyond the coxae of the mesothoracic pair of legs but fails to reach the coxae of the metathoracic pair.

Thorax and abdomen.—Length of hind tibiae 2.213-2.365. The basal half of the hind tibia is much swollen and has many sensoria which are irregular in size and shape. Hind tarsi .171. The cornicles are 1.428 long and typical of the species. The cauda is from .371-.456 long, it is not constricted and has three hairs on one side and four hairs on the other.

Morphotype.—Male. With the following data: Colorado National Monument near Glade Park, Colorado. Host *Aster laevis*. Oct. 1, 1947. Deposited in the United States National Museum.

Morphotype.—Oviparous female. Same data as male. Deposited in United States National Museum.

This species as pointed out by Dr. Knowlton is allied with the species he described and named *Macrosiphum escalantis*. In *Macrosiphum escalantis* the male is alate. All forms of *Macrosiphum katonkæ* are larger than corresponding forms of *Macrosiphum escalantis*.

Macrosiphum wasintæ (Hottes)

Alate male.

Size and general color.—Length from vertex to tip of anal plate 1.356. Head and thorax dusky brown. Head darker anteriorly and thorax darker dorsally. Abdomen green with four broken brownish bands extending from the pleura towards the middle. These bands are anterior to the cornicles. Abdomen posterior to the cornicles brownish. Cornicles, cauda, anal plate and gonapophyses brown. Antennae with the exception of I, II, and the base of III dark brown. Tibiae brown with the apical portions darker.

Head and appendages.—Average width of head across eyes .499. Antennal segments with the following proportional lengths: III—.756, IV—.714, V—.771, VI—.214 + 1.11. Secondary sensoria distributed as follows: III—67 scattered over entire surface; IV—30 arranged as on III; V—30 confined more or less to one side of segment. The beak extends to the coxae of the metathoracic pair of legs. The fourth and fifth segments of the beak are as long as the second segment of the tarsi.

Thorax and appendages.—Veins of wings dark brown bordered with fuscous. Stigma long and narrow, (that of morphotype not typical) tapering to a point. Tibiae brownish with apical portions darker. Hind tibiae from 1.856-2.384 long. Hind tarsi .157 long.

Abdomen.—Cornicles from .399-.542 long, dusky brown, shaped as in females. Cauda dusky brown .171 long with four hair on a side. Gonapophyses almost triangular with many hair.

Oviparous female.

Size and general color.—Length from vertex to tip of anal plate 1.99-2.17. In color as in apterous viviparous female, also buff, coral, brown and light red. Head and appendages.—Antennal segments with the following comparative lengths: III—.643, —.742 ave. .688, IV—.614-.685 ave. .647, V—.442-.642 ave. .566, VI—.171-.214 ave. .199, +.742-.828 ave. .813 Secondary sensoria limited to III varying from 1-5 most common number 3

Thorax.—Hind tibiae varying from 1.856-2.384. Basal third of tibia with sensoria and much swollen.

Abdomen.—Cornicles varying from .449-.60 in length. The form of the cornicles is similar to the form of the cornicles of the viviparous females. As a rule the cornicles are milk-white in color but some have the cornicles more or less brown. The cauda is from .171-.214 long average length .192. Posterior to the cornicles the abdomen is much narrowed and elongated.

Morphotype.—Alate male. Data associated with morphotype: Skyway. Colorado Oct. 3, 1947. Host *Dasyphora fruticosa*. Deposited in United States National Museum.

Morphotype.—Apterous oviparous female same data as for morphotypic male. Deposited in United States National Museum. Paramorphotypes

in collection of author same data as morphotypes also taken on Sept. 22, 1947.

The alate form of this species has not been taken.

Kakimia takalus (Hottes)

Oviparous female.

Size and general color.—Length from vertex to tip of anal plate 1.71-2.242 ave. 1.999. Color uniform light yellowish-green. Appendages as in apterous viviparous female.

Head and appendages.—Width across eyes .4284-.499 ave. .461. Comparative lengths of antennal segments as follows: III—.456-.571 ave. .499, IV—.285-.342 ave. .313, V—.199-.288 ave. .208, VI—.085 +.357-.428 ave. .385. Secondary sensoria only slightly peg-like, confined to third segment, irregularly arranged on basal half of segment and with a tendency to be confined to one side. The sensoria are irregular in size and number from 8-10. The antennal segments from III to VI get progressively darker especially the tips of segments. Segment VI is dusky brown. The beak extends just beyond the coxae of the metathoracic pair of legs. The fourth and fifth segments are dusky brown.

Thorax and appendages.—Hind tibiae 1.075-1.171 ave. 1.128. The basal half of the tibia is swollen and provided with sensoria. Hind tarsi .0785-.0856. Like the base of the sixth antennal segment they are conspicuously short. The first segment of the tarsus is recessed within a depression at the apex of the tibia, this shortens the apparent length of the tarsus.

Abdomen.—Cornicles varying in length from .399-.428 similar in form to those of viviparous forms. Cauda about .218 long with three hairs on a side. The cauda of this form is not as slender and thin as the cauda of the apterous viviparous female. Body hair long and sparse slightly knobbed at the tip. Morphotype. Apterous oviparous female. Data associated with morphotype: Host *Gilia aggregata*. Taken in Unaweep Canyon about fifteen miles from Whitewater, Colorado. Sept. 26, 1947. Deposited in United States National Museum. Three paramorphotype slides in collection of author.

MAY 4 - 1948

NATIONAL MUSEUM
PROCEEDINGS

April 30, 1948

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW SPECIES OF APHIIDAE

BY F. C. HOTTES

Two apparently new species of plant lice are herewith described. Attention is also called to what appears to be a little known case of aphid synonymy.

Aphis unaweepiensis, new species

Apterous viviparous female

Size and general color.—Length from vertex to top of anal plate 1.99-2.97, average length 2.62. General color varying from light blue gray to light greenish-gray. The body is not shining but has an exceedingly light amount of powder-like pulverulence. The following structures are more or less dusky brown to brown: the head particularly the vertex and the dorsum, segment one of the antennae and the apical portions of the third fourth and fifth antennal segments. The apical three fourths of the sixth segment is also as a rule brown. The apical portions of the femora and tibiae and the entire tarsi are brownish, and so are the third fourth and fifth segments of the rostrum. The cornicles are more or less brownish throughout but the apical portions are dark brown to almost black. In living specimens the cornicles are very conspicuous. The cauda is brown and noticeably darker near the tip and along the outer margins. The anal plate is brownish particularly so near the outer margin.

Head and appendages.—There are no secondary sensoria. The ocular tubercles are poorly developed and are difficult to see on some specimens. All antennal segments are coarsely imbricated. Proportional length of antennal segments as follows: III .199-.242, most common length .214, IV 2.14-.228 most common length .214 or sub equal to III, V .199-.214 as a rule equal or subequal to III, VI .114-.128 +.138-.199. The head is very broadly set on to the thorax so that it appears to be wider through the eyes than it actually is .499-.528. The vertex is broadly rounded. The head is somewhat extended laterally and then recessed for the attachment of the first antennal segment. On the dorsum there are two small faceted areas suggestive of wax glands. The first antennal segment is short and wide and out of proportion as to width in regard to the second. The apical margin of the first segment is as a rule wavy or scalloped. The third segment of the rostrum extends beyond the coxae of the metathoracic pair of legs and the fourth and fifth segments which measure .214 or about equal to the third antennal segment, considerably beyond them. The hair on the antennae are exceedingly sparse and fine. In length the antennal hair vary from one fourth to a little less than one half the width of the segment. As a rule they are very short and much inclined.

Thorax.—There are no lateral tubercles on the thorax. The hind tibiae are from .999-1.05 long. The hind tarsi vary from .128-.142 in length. The hair on the tibiae are sparse and very evenly distributed. In length the hair on the tibiae are somewhat shorter than the width of the segment. It should also be noted that the hair at the apex of the tibia is of the same character and distribution as that found elsewhere.

Abdomen.—As a rule two poorly developed lateral tubercles may be seen anterior to the cornicles, and one pair, poorly developed far posterior to them. The tubercles are difficult to see. The cornicles vary in length from .285-.357. As a rule the cornicles the about .328 long, they taper slightly from their origin to the apex which is without a flange. The cornicles are imbricated but less so than the antennae. The cauda is almost a perfect triangle, its surface is setulose, on the outer margins one may find from five to six hair. The cauda is as a rule .1428 long. The anal plate is very wide and short, on its posterior surface there is a row of hair, on its upper surface it is setulose.

This species probably belongs to the outer fringe of the *Aphis maidi-radialis* Forbes *Aphis middletoni* Thomas (as interpreted by Gillette and Palmer) complex. From these species it differs in the following ways: antennal segments III, IV, and V are as a rule equal or segments IV and V are subequal to III, the much longer rostrum, and the less hairy cauda. The thorax is also free from lateral tubercles and the tubercles on the abdomen are more poorly developed. From *Aphis middletoni* it differs in the total lack of secondary sensoria.

One may hazard the guess that the species has no alternate host, or if it has that the alternate host is not corn.

Holotype.—Apterous viviparous female. Data associated with Holotype: Host *Sarcobatus vermiculatus* which is commonly known as Greasewood. Unaweep canyon, near Whitewater, Colorado. July 10, 1947. Deposited in United States National Museum. Paratypes from the same locality taken on the following dates: July 10, and 28, 1947 and Aug. 4, 1947. All specimens were taken feeding on the roots near the crown of the host. Apparently this species is quite rare but the difficulty and labor involved in collecting it may account for the above statement. It may be reared with ease away from its natural habitat. Despite attempts to collect alate specimens or to rear them they are yet to be found. The writer wishes to thank Prof. M. A. Plamer for her opinion regarding this form.

Macrosiphum yagasogae, new species

Alate viviparous female.—This form is described from one specimen which was badly injured after mounting. Because of this fact it is not made the holotype.

Size and general color.—Length from vertex to tip of anal plate 3.18. Width across eyes .585. Head antennal tubercles and first two antennal segments dusky brown shading to brown. Thorax dusky brown except for the areas surrounding the insertion of a comparatively few hair. These areas are clear and suggest small sensoria when one does not see the hair. Abdomen greenish-yellow except for a few dusky spots on the dorsum near the anterior end and in the region of the cornicles and for more or less confluent spots on the lateral surfaces. The cornicles are

more or less dusky throughout but are darkest at the base and apex. The femora are quite pale except for a slight brownish tinge at the knees. The tibiae are pale except for a distance at the apex a little longer than the tarsi which is brownish. The tarsi are brown.

Head and appendages.—Antennal segments three and four quite pale except for apical portions which are dusky. Antennal segments five and six dusky. Proportional lengths of antennal segments as follows: III .928, IV .771, V .756 (measured from two parts), VI .28 + 1.51 (measured from three parts). Segment three is very faintly imbricated, segment four from the middle towards the apex is lightly imbricated, and segments five and six are moderately imbricated. The secondary sensoria are limited to the third segment, they occur in a straight row, have narrow rims and number 13 on one antenna and fourteen on the other. The antennae have very few fine sharp-pointed hair. On the third segment they are much shorter than one half the width of the segment and on the fourth segment they are about one half the width of the segment in length. The hair on the antennal tubercles and the vertex is fine and a little longer than the hair on the first and second antennal segments. All hair on the head and body is sharp-pointed. Segments four plus five of the rostrum measure .142 long. The fourth segment of the rostrum has four inwardly pointed hair on each side, these are about one half the width of the segment in length.

Thorax and appendages.—The prothorax has a pair of very poorly developed lateral tubercles, these are hardly more than slightly raised circles. The wings have been destroyed. The hind tibia are 2.54 long. The hair on the basal half of the tibia is finer and somewhat shorter than that near the middle. On the brown portion of the tibia the hair is fine and short. The hair on the tibia is of two types a fine shorter type alternating more or less with a longer coarser type. The tarsi measure .214 long, the convex surface of the second segment is almost free from hair while the concave surface is quite hairy.

The abdomen.—The cornicles measure .785 in length. They are of uniform width and have a slightly developed rim. The last .171 of the cornicles is reticulated. The anal plate is quite narrow and strongly curved and because of this is rather long. The cauda is about .785 long, it has a setulose surface and has three hair on one side and four on the other.

Apterous viviparous female

Size and general color.—Length from vertex to tip of anal plate 3.14. Width across eyes .656. With the exception of the parts enumerated the body is uniformly cream colored. Vertex and antennal tubercles slightly dusky. The apical portions of the third and fourth antennal segments are slightly dusky, the apical portion of the fifth segment is darker than that of the third and fourth. The sixth segment is uniformly dusky. All legs are pale except the apical portions of the tibiae which are light dusky, and the tarsi which are brown.

The distal portions of the cornicles are light dusky with the slightly developed rim darkest. The cauda is concolorous with the abdomen except for the darker setulose surface.

The head and appendages.—Antennal segments with the following proportional lengths: III .91, IV .57, V .71, VI .21 + .92. Near the base of the third antennal segment there may be one small narrow-rimmed

secondary sensorium. This sensorium may also be lacking. The hair on the antennae are sparse fine, sharp-pointed and about one half the width of the segment in length. All antennal segments are lightly imbricated. The rostrum has segments four and five dusky to dark brown, it extends beyond the coxae of the mesothoracic pair of legs.

Thorax and appendages.—Hind tibiae 1.87 long. Hind tarsi .199 long. The hair on the hind tibiae is similar to that found on the tibiae of the alate viviparous female.

The abdomen.—The cornicles measure .71 in length, the reticulations at the apex are similar to those found on the alate female but do not extend so far. The anal plate is not as deep as that of the alate viviparous female. The cauda is .35 long otherwise as in the alate viviparous female.

The oviparous female

Size and general color.—Length from vertex to tip of anal plate 2.39, color more translucent white than that of the apterous viviparous female, with dusky or brownish markings as follows: The extreme tip of the rostrum. The apical half of the base of the sixth antennal segment and all of the terminal process very light dusky. The apical portions of the tibiae and the tarsi are light-brown, much lighter in color than the same structures in the apterous viviparous female.

Head and appendages.—Antennal segments with the following proportional lengths: III .65, IV .54, V .54, VI .22 + 1.28. There may be one or no sensoria near the base of the third antennal segment. The rostrum extends just beyond the mesothoracic pair of legs.

Thorax and appendages.—The hind tibiae are 1.98 long, the sensoria on this segment extend well beyond the middle and are very difficult to see because of the lack of color on the surface of the tibia. The hair on the tibiae is mixed as is the case in the viviparous forms.

Abdomen.—The cornicles are .71 long. The cauda is .25 long and as a rule has four hair on a side.

Holotype apterous viviparous female.

Morphotype alate viviparous female.

Morphotype oviparous female.

All types have been deposited in the United States National Museum.

Data associated with types. Apterous viviparous female Skyway, Colo. July 22, 1947.

Alate viviparous female Skyway, Colorado July 15, 1947.

Oviparous female Skyway, Colo. Sept. 23, 1947.

This species may be collected on the under sides of the leaves of Solomons Seal *Polygonatum commutatum*. It is very easily disturbed and the slightest jar causes specimens to drop to the ground. As a rule the specimens are taken as solitary individuals and never more than one or two to a plant. I have collected many immature individuals but mature ones are few. This species is perhaps most closely related to *Macrosiphum mertensiae* G. & P. from which it differs in the apterous viviparous female in having from 0 to one secondary sensorium on the third antennal segment, the fifth segment being longer than the fourth, and by the rostrum extending beyond the coxae of the mesothoracic pair of legs. By some it may also be considered close to *Macrosiphum euphorbiae* (Thomas). From *Macrosiphum euphorbiae* this species differs by the color not being pink or green in the apterous forms, and

by the apterous forms not having more than one secondary sensorium on the third antennal segment. The alate form of this species differs from the alate of *Macrosiphum euphorbiae* in having lateral spots as well some spots on the dorsum, and by the legs and antennal segments being much paler. For those who may question my use of the term *euphorbiae* for the species which Dr. Frison and I in the Plant Lice or Aphidae of Illinois referred to as *Macrosiphum gei* (Koch) I refer to the work of Dr. D. Hille Ris Lambers, Contributions to a Monograph of the Aphididae of Europe, Temmincka Vol. IV, pp. 84-89, 1939. In Stylops a Journal of Taxonomic Entomology Vol. II, part 8, Aug. 15, 1935 Dr. Lambers on page 170 calls attention to the fact that Mordwilko was able to separate *Macrosiphum gei* from *Macrosiphum solanifolii* (Ashmead) species which Theobald considered synonymous and whom Dr. Frison and I followed in the Aphidae of Illinois. In this paper we placed *euphorbiae* as a synonym of *gei* and called attention to the fact that *euphorbiae* was similar to *solanifolii*. If Mordwilko's findings are correct this synonymy must be corrected and the species named by Thomas because of its priority stand over that described and named by Ashmead.

Mordwilko states that *Macrosiphum gei* always has at least 17 hairs on the cauda and *Macrosiphum solanifolii* at most 14.

Through the kindness of Dr. H. H. Ross of the Illinois Natural History Survey I have been loaned two of the three slides of *Macrosiphum euphorbiae* belonging to the type series of the Thomas collection. I have made a careful count of the hairs on the caudas of six specimens and find one specimen with eight hairs, two with nine and three specimens with eleven.

Macrosiphum yagasogae has hair on the cauda as follows: alate viviparous female nine, apterous viviparous female nine, oviparous female ten to eleven.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE TECHNICAL NAME OF THE VIRGINIA DEER
WITH A LIST OF THE SOUTH AMERICAN FORMS

By PHILIP HERSHKOVITZ

The earliest valid scientific name for the Virginia, or White-tailed Deer is *Dama virginiana* Zimmerman ("Geographische Geschichte des Menschen und der vierfüßigen Thiere," Leipzig, vol. 2, pp. 24, 129, 1780). The work cited is well known but has been overshadowed by the same author's earlier "Specimen Zoologiae Geographicae, Quadrupedum . . ." published in 1777. This work, in Latin, was critically reviewed by J. A. Allen (Bull. Amer. Mus. Nat. Hist., vol. 16, pp. 13-22, 1902) and all the names proposed therein, including *Dama virginiana* (in Zimmerman, pp. 532, 678, and map opposite p. 36, 1777) were adopted. Opposition to Allen's measure arose (in Allen, *op. cit.*, p. 161, 1902) and centered on the questionable construction of some of the technical names in the "Specimen Zoologiae Geographicae." Most authors, including the present, now reject all names in Zimmerman's 1777 opus. On the other hand, scientific names appearing in the later "Geographische Geschichte" are properly proposed and, save for *Dama virginiana*, are universally cited. The several North American species first named by Zimmerman, 1780 and recognized by Miller (List of North American Recent Mammals, 1923), are as follows: *Bos moschatus* Zimm., vol. 2, p. 86 (= *Ovibos moschatus moschatus*, Miller, p. 494; genotype of *Ovibus* Blainville), *Lutra (minima)* Zimm., vol. 2, p. 317 (genotype of *Chironectes* Illiger, Miller, p. 9), *Dipus Hudsonius* Zimm., vol. 2, p. 358 (= *Zapus hudsonius hudsonius*, Miller, p. 432; genotype of *Zapus* Coues), *Phoca fasciata*, Zimm., vol. 3, p. 277, 1783 (= *Phoca fasciata*, Miller, p. 164; genotype of *Histriophoca* Gill).

Omission of *Dama virginiana* from the "Check List" is unaccountable. Miller's objection (Proc. Biol. Soc. Washington, vol. 15, p. 39, 1902) to the use of *Dama* dating from Zimmermann's "Specimen Zoologiae Geographicae," 1777, cannot

be applied to either the generic or specific name proposed by Zimmermann in 1780 for the Virginia Deer.

In the first part of the "Geographische Geschichte," 1780, Zimmermann showed that in spite of opinions to the contrary held by other Linnaean authors, the Virginia Deer is not the same as the Fallow Deer. Under the heading (p. 24) "Der Damhirsch," identified in the footnote as *Cervus dama* Linnaeus, Zimmermann states, "Ich habe mir Mühe gegeben, den Damhirsch in Amerika aufzusuchen; allein bis jetzt sehe ich mich völlig in der Pennantischen Meinung bestätigt, nämlich, dass er nirgends als in der alten Welt lebt. Die Hörner, so Herr Pennant von dem sogenannten amerikanischen Damhirsche geliefert hat, sind ohne Schaufeln, also ohne Hauptkennzeichen dieser Art. Daher halte ich den virginischen Damhirsch (*Dama virginiana* Raj. Synops., p. 86) für eine neue nicht völlig genau bestimmte Art, . . ." (italics mine). In the second part of the "Geographische Geschichte," Zimmermann formally distinguished the two deer from each other by describing each under a new name, thus:

[p. 128] "42 Der Dammhirsch [*sic*]
 "*Platyceros Plinii Cervus (Dama)* Linn. XII. Erxl. p. 309
 "Fallow Deer Penn. p. 48."

[Description follows]

[p. 129] “44) “Der Virginische Hirsch
 “*Dama Virginiana*. Raji synops. quadr. p. 86 [1693]
 “Fallow Deer, Lawson Carolina p. 123. Virginian Deer. Pennant
 Syn. p. 51. Tab. IX, fig. 2. Die Hörner.

“Die Hörner sind stark vorwärts, halb zirkelförmig gebogen; haben keine Stirnzinken; oberwärts mit vielen Enden besetzt. Grösse eines Dannhirsches [*sic*]. Farbe graulich braun, (ziemlich helle.) Schwanz länger als am Reh. Eine völlig von unserm Dannhirsche [*sic*] verschiedene Art. Bewohnt in grossen Heerden Carolina, Virginien, Louisiana, und geht vielleicht bis Panama hinunter.”

Judged by the description, the name *virginiana* is based primarily on Pennant's "Virginian Deer" though Ray is cited first. Ray (*op. cit.*) gave no technical name to the Virginia Deer. He merely quoted, under his cervine subdivision "*Cervus* PLAYTYCEROS" the description of a menagerie specimen originally from Virginia ("*Virginianae*") which he believed to be distinct from the true Fallow Deer. Obviously, it was Zimmermann's intention to credit Ray as the *first* author to make a distinction between the two kinds of deer and not as the author of a distinct name for the Virginia Deer. Allen (*op. cit.*) had already assigned all the North American forms of Virginia Deer to the genus *Dama* Zimmermann. Unfortunately, this revision remained practically stillborn for two reasons. First, Allen dated the name *Dama* from the controversial "Specimen Zoologiae Geographicae," 1777, instead of the accepted "Geographische Geschichte," 1780. Second, Palmer's inconsiderate instruction (in Allen, Bull. Amer. Mus. Nat. Hist., vol. 19, p. 591, footnote, 1903) that *Dama* Zimmermann was "preoccupied" by *Dama* Frisch, 1775, apparently "settled" the issue. Consequently, Allen and others revived *Odocoileus* Rafinesque, 1832, as the generic name for the

Virginia Deer. Since then, Palmer (in conversation, 1941) has denied the validity of Frisch's names. This opinion has been expressed previously by Sherborn (Index Animalium, p. xxv, 1902), and by Thomas and Miller (Ann. Mag. Nat. Hist., ser. 7, vol. 16, pp. 461-464, 1905).

With Frisch's names put aside, it appears necessary to substitute *Dama* Zimmermann, 1780, for *Odocoileus* Rafinesque, 1832. *Dama virginiana* Zimmermann (*loc. cit.*), with type locality restricted to Virginia, is the genotype by monotypy. The generic name *Dama* for the Fallow Deer, *Cervus dama* Linnaeus, heretofore credited to either Frisch, 1775, or to H. Smith, 1827, may be replaced by *Platyceros* Zimmermann (*loc. cit.*, p. 128; antedates *Platyceros* Wagner, 1844), with type *Platyceros Plinii* Zimmermann (= *Cervus dama* Linnaeus).

Most, if not all the confusion attending the taxonomic history of the Virginia Deer could have been avoided by strict application of the Law of Priority. The generic names successively given to representatives of the Virginia Deer are *Cervus*, *Mazama*, *Dorcelaphus*, *Cariacus*, *Oplacerus*, *Coassus*, *Reduncina*, *Macrotis*, *Gymnotis*, *Mamcariacus*, *Odocoelus* and *Odontocoelus*, the last two emendations of *Odocoileus* Rafinesque. The name *Odocoileus*, etymologically bad and typified by an upper premolar from a cavern deposit described as *O. spelaeus*, is now universally applied to the Virginia Deer. It appears to have no better claim to recognition as a *nomen conservandum* than any of the other synonyms of *Dama* Zimmermann. Accordingly, the generic name *Dama* Zimmermann, 1780, for the Virginia Deer, is here revived with the hope that this note will afford an opportunity to other workers to express opinions on the matter.

The first properly constituted name for a South American Virginia Deer is [*Cervus*] *Capreolus cariacou* Boddaert (Elenchus Animalium, vol. 1, p. 136, 1784 or 1785). Boddaert cited "Buffon. XII. tab. 44." as sole reference and gave the "habitat in Guyania, Brasilia." The reference to Buffon is contained in the "Histoire Naturelle, générale et particulière avec la description du Cabinet du Roi," vol. 12, p. 321, 1764, in these words: "Cet animal, s'appelle à Cayenne *cariacou*, d'où il a été envoyé vivant sous ce même nom *cariacou*, & nous en donnerons ici la description." There follows (*op cit.*, p. 347) an elaborate description and a figure (Pl. XLIV) of an adult doe of the common species, *Dama virginiana*. Boddaert's *cariacou* antedates *cariacou* Kerr (Animal Kingdom, p. 305, 1792) based on Smellie's translation (vol. 7, p. 34, pl. cci, 1780) of Buffon's description of the *cariacou*. Kerr's *Cervus sylvaticus* (*loc. cit.*), founded on the "Biche de Bois" of Barrere (France équinoxiale, p. 151, 1741), is another name for the same animal. The *Cervus Cuguapara* of Kerr (*loc cit.*) is a synonym of *Cervus bezoarticus* Linnaeus and not, as was supposed by Miranda Ribeira (Rev. Mus. Paulista, São Paulo, vol. 10, pp. 1-27, 1919) a Virginia Deer. This author misquoted Kerr's name as "*Odocoelus suaçuapara* (Kerr)?" and applied it to the Virginia Deer of northeastern Brazil. *Cervus spinosus* Gay and Gervais (Ann. Sci. Nat., ser. 3, zool., vol. 5, p. 93, 1846) described from antlers of a Virginia Deer from Cayenne, is also an absolute synonym of *cariacou* Boddaert. For a long time, the name *Cervus campestris* Cuvier (Diet. Sci. Nat., vol. 7, p. 484, 1817) had been applied to the Pampas Deer of Paraguay and Argentina (= *Ozotoceros bezoarticus leucogaster* Goldfuss). The original description of *campestris*,

however, can apply only to the Virginia Deer specimens of which, from unknown localities, were examined by Cuvier. Cabrera (Rev. Mus. La Plata, n. s., vol. 3, zool., pp. 5-41, 1943) discussed thoroughly the status of *Cervus campestris* and identified it (p. 11) with the Virginia Deer of the Guianas and northern Brazil. Accordingly, *campestris* Cuvier (*nec auctorum*) also falls into the synonymy of *cariacou* Boddaert. *Cervus savannarum* Cabanis (in Schomburgk, Reisen British Guiana, vol. 3, p. 784, 1848) from the vicinity of Fort San Joaquin, upper Rio Branco, Amazonas, Brazil, may prove to be an intergrading form not definitely assignable to either *cariacou* or *gymnotis* Wiegmann from the lower Orinoco. Geographically, *savannarum* is nearer *gymnotis* and tentatively may be regarded as a synonym of it. *Cervus mangivorus* Schrank (Wetteranischen Gesellsch., vol. 1, heft 2, p. 327, 1819) is based on a specimen obtained in Brazil by Spix. Schrank's synonymy of *mangivorus* is a composite of Virginia Deer ("*cariacou* Buffon") and brocket ("*Cervus minor* Barrere," "*Cuguacu-eté* Mare[grave]"). The original description can be applied to any one species of Brazilian deer. Allen (Bull. Amer. Mus. Nat. Hist., vol. 34, p. 524, 1915) justifiably disposed of *mangivorus* as unidentifiable.

Other named forms of South American Virginia Deer, apparently subspecifically distinct from *cariacou*, are included in the list given below. The generic name *Dama* Zimmermann is reintroduced, provisionally, and the oldest specific name, *virginiana* Zimmermann, is pertinent to all the Neotropical races (*cf.* Lydekker, Cat. Ungulate Mammals, British Museum, vol. 4, pp. 155-176, 1915). A more complete account of the taxonomy, interrelationship and distribution of the South American representatives of the Virginia Deer has been prepared by the author and will appear among the Proceedings of the United States National Museum.

PROVISIONAL LIST OF THE SOUTH AMERICAN SUBSPECIES OF *DAMA VIRGINIANA*

1) *Dama virginiana cariacou* Boddaert, Elenchus Animalium, vol. 1, p. 136, 1784 or 1785. Type locality, "Guyania, Brasilia," here restricted to Guyane, coastal French Guiana. (Synonyms, *sylvaticus* Kerr, *cariacou* Kerr, *campestris* Cuvier, *spinosus* Gay and Gervais, *suaçupara* Miranda Ribeiro).

2) *Dama virginiana gymnotis* Wiegmann, Isis (von Oken), p. 955, footnote 4 (name), pp. 963-968 (description). Type locality, "stammt aus Columbien. Sein früherer Besitzer empfieng es über S. Thomas aus der Gegend des Orenoco;" redetermined by Osgood (Publ. Field Mus. Nat. Hist. zool. ser., vol. 10, p. 138, 1914) as "the Orinoco region, doubtless the savannas on the lower part of the river," Venezuela. (Synonyms, *savannarum* Cabanis, *wiegmanni* Fitzinger, *tumatumari* Allen [the type skull only; originally described as a *Mazama*]).

3) *Dama virginiana margaritae* Osgood, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 24, pls. II-III, 1910. Type locality, vicinity of Puerto Viejo, Margarita Island, Venezuela.

4) *Dama virginiana curassavicus* Hummelinck, Studies on the Fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, Utrecht, pp. 65, 91, pl. VIa, 1940. Type locality, Island of Curaçao, Dutch West Indies.

5) *Dama virginiana tropicalis* Cabrera, Bol. Soc. Real española Hist. Nat., Madrid, vol. 18, p. 306, 1918. Type locality, La María, Río Dagua Valley, near Buenaventura, western Colombia.

6) *Dama virginiana goudotii* Gay and Gervais, Ann Sci. Nat., Paris, ser. 3, zool., vol. 5, p. 94, 1846. Type locality "Les régions élevées de la Nouvelle-Grenade;" here restricted to the Páramo de Suma Paz, south of Bogotá, Cundinamarca, Colombia, for reasons shown (in press). (Synonym, *columbicus* Fitzinger).

7) *Dama virginiana lasiotis* Osgood, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 136, 1914. Type locality, Páramo de los Conejos, Sierra de Mérida, Venezuela, altitude, 9,000 feet. (Doubtfully distinct from *goudotii*).

8) *Dama virginiana consul* Lönnberg, Arkiv für Zool., vol. 14, no. 20, p. 13, 1922. Type locality, Guamaní, páramos of the Cordillera Oriental on road to Papallacta, Pichincha Province, Ecuador, 12,000 feet altitude. (Doubtfully distinct from *goudotii*).

9) *Dama virginiana peruviana* Gray, Ann. Mag. Nat. Hist., ser. 4, vol. 13, p. 332, 1874. Type locality, "Ceuchupate," (probably = Com-bapata, Cuzco), Peru, altitude, 11,000 feet. (Synonyms, *brachyceros* Philippi, *philippii* Trouessart).

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW BOOBY AND A NEW IBIS FROM SOUTH
AMERICA

By W. E. CLYDE TODD

During the course of a study of the Gannets and Ibises in the collection of the Carnegie Museum, recently completed, there was discovered in each group one form which appeared to be sufficiently distinct to warrant recognition as a subspecies, and for which no name is yet available. The Booby I propose to call

Sula neboxii excisa, subsp. nov.

Type.—No. 123,700, Collection Carnegie Museum, adult male; Seymour Island, Galapagos Islands, off Ecuador, April 6, 1939; Arthur C. Twomey.

Subspecific characters.—Similar to *Sula neboxii neboxii* Milne-Edwards of the Pacific coast of South and Middle America, but larger, and general coloration lighter.

Range.—Galapagos Islands.

Measurements.—

No.	Sex	Locality	Wing	Tail	Culmen
123699 ¹	♂	Seymour I. _____	427	216	114
123700 ¹	♂	Seymour I. _____	428	245	107
115966 ²	---	Chatham I. _____	445	256	116
189065 ²	♀	Daphne [Major] I. _____	438	230	112
189066 ²	♀	Daphne [Major] I. _____	450	225	114
316904 ²	♂	Indefatigable I. _____	414	222	100
Average of males, <i>vide</i> R. C. Murphy _____			422	204.7	105.2

¹Collection Carnegie Museum.

²Collection U. S. National Museum.

Remarks.—Not only are Galapagos Islands birds larger, sex for sex, than those from Lobos de Tierra, but their coloration is much lighter, especially around the head and neck. These distinctive features were noted by Dr. Robert Cushman Murphy some years ago (*Oceanic Birds of South America*, vol. 2, 1936, p. 830), but he very properly forebore to name the island form until a larger series should be available. Since the examination of these additional specimens appears to validate his conclusions, there can remain no good reason for refusing to recognize the form by name.

The new Ibis will stand as

Theristicus caudatus hyperorius, subsp. nov.

Type.—No. 120,047, Collection Carnegie Museum, adult male; Buena Vista, Bolivia, August 10, 1928; José Steinbach.

Subspecific characters.—Similar in size and proportions to *Theristicus caudatus caudatus* (Boddaert) of northern South America, but general coloration paler; the ground color of the back lighter gray (between hathi gray and storm gray of Ridgway), with the feather-edgings lighter and hence more conspicuous; underparts also lighter in color (more brownish, less blackish); and tail tending to steel green (rather than to steel blue).

Range.—Eastern Bolivia and the Paraguayan Chaco, to Brazil and northern Argentina.

Remarks.—Salvadori, in his review of this genus (*Ibis*, 1900, 501-517), records specimens from Cayenne, Colombia, Venezuela, Bolivia (one), Brazil, and Argentina. He refers to the lighter, more grayish coloration of the Bolivian and Brazilian specimens. I have examined five skins from Bolivia (Buena Vista, Rio Azero (5,000 ft.), and Chatarona); they are definitely different, in the respects above pointed out, from Colombian and Venezuelan specimens, here referred, on geographical grounds, to typical *caudatus*, described from Cayenne. Paraguayan specimens in the U. S. National Museum are if anything paler and grayer than those from Bolivia. Taken as a whole the series stands out sufficiently well from the northern bird to be worthy of a name.

For the loan of pertinent additional material for study in this connection I am indebted to the authorities of the Academy of Natural Sciences of Philadelphia and of the United States National Museum.

PROCEEDINGS
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SYNONYMY OF VARIOUS DIPLOPODS

By H. F. LOOMIS, *Coconut Grove, Florida*
and

RICHARD L. HOFFMAN, *Miller School of Biology, University of Virginia*

The following notes on the synonymy of diplopods, principally of the United States, are presented at this time as much delay might occur if their publication was deferred until revisionary or other systematic papers on their respective groups could be prepared and published.

Family *CAMBALIDAE*

Genus *Hypocambala* Silvestri

Abh. u. Ber. K. Zool. u. Anthr.-Ethn. Mus. Dresden, Bd. 6, N. 9, P. 11,
Taf. 2, pp. 59-62; 1897.

Agastrophus Attems, Zool. Jahrb., Syst. 13, p. 151; 1900.

Trichonannolene Chamberlin, Ent. News, 33: 85-86; 1922.

Hypocambala helleri Silvestri

Hypocambala helleri Silvestri, loc. cit.

Trichonannolene guiananus Chamberlin, loc. cit.

There can be no question in placing *Trichonannolene* as a synonym of Silvestri's genus, as comparison of Chamberlin's figure with that of Silvestri's in Pac. Ent. Surv., Publ. 8, Art. 1, p. 9, 1935, will show. Also it seems that *T. guiananus* is a synonym of *H. helleri*, as the gonopods are almost identical and the number of ocelli, a somewhat variable character, appears to be the only basis on which two species could be maintained.

Family *SPIROBOLIDAE*

Genus *Hiltonius* Chamberlin

Proc. Biol. Soc. Wash., 31: 166; 1918.

Hiltonius hebes (Bollman)

Spirobolus hebes Bollman, Ann. N. Y. Acad. Sci., 4: 30; 1887.

Tylobolus hebes Cook, Myr. N. W. North Amer., Harriman Alaska Exped., 8: 66; 1904.

Hiltonius balboanus Chamberlin, Bull. Univ. Utah, 31(11): 10; 1941.

Although neither of the original pair of types of Bollman's *Spirobolus hebes* has been examined, numerous specimens collected at San Diego, the type locality, and Chula Vista, California, have been identified as that species on the basis of his description.

Chamberlin's description and illustration of *H. balboanus*, collected at San Diego, indicate that it is synonymous with Bollman's *hebes*.

In erecting the genus *Tylobolus*, Cook, who found only the female of Bollman's two type specimens in the U. S. National Museum collection, thought that the species undoubtedly was congeneric with *Tylobolus deses*, the genotype. However, study of male topotypes of *hebes* indicates that it should be associated with the species of the genus *Hiltonius*.

Genus *Spirostrophus* Saussure & Zehntner

Grandidier, Madagaskar, p. 150; 1902.

Glosselus Cook, Proc. U. S. Nat. Mus., 40: 163; 1911.

Cairibolus Chamberlin, Bull. Mus. Comp. Zool., 62: 209; 1918.

Litobolus Chamberlin, Proc. Acad. Nat. Sci. Phil., 99: 47; 1947.

Spirostrophus naresi (Pocock)

Spirobolus naresii Pocock, Ann. Mag. Nat. Hist., Ser. 6, 11: 252; 1893.

Trigoniulus naresii Brolemann, Mem. Zool. Soc. Fr., 13: 94; 1900.

Spirobolus (*Spirostrophus*) *naresi* Sauss. & Zehnt., loc. cit.

Spirostrophus naresii Attems, Voeltzkows Reise Ostafrika, 3: 99; 1910.

Glosselus musarum Cook, loc. cit., p. 165.

Glosselus naresii Cook, loc. cit., p. 166.

Trigoniulus remotus Chamberlin, Bull. Mus. Comp. Zool., 62: 212; 1918.

Spirostrophus remotus Chamberlin, Proc. U. S. Nat. Mus., 61: 14; 1922.

Litobolus hanevavus Chamberlin, Proc. Acad. Nat. Sci. Phila., 99: 49; 1947.

Specimens collected by Loomis in 1937 at Cairo and Guapiles, Costa Rica, have been identified as *naresi* and it is believed that *Glosselus musarum* (the types of which came from a locality between these two adjacent small towns) also is *naresi*, as the original description does not preclude this disposition.

It is strongly suspected that *Cairibolus antonianus* Chamberlin, the type of his genus cited above, is a synonym of *naresi* but neither his type or paratype specimens have been examined.

In addition to being known from a number of tropical countries of both hemispheres, *naresi* has been reported from at least six of the Marquesas Islands, including Fatuhiva whence came the specimens described by Chamberlin as *Litobolus hanevavus*—obviously a synonym of *naresi*.

Family XYSTODESMIDAE

Genus *Mimuloria* Chamberlin

Ent. News, 39: 155; 1928.

Mimuloria georgiana (Bollman)

Fontaria georgiana Bollman, Proc. U. S. Nat. Mus., 11: 344-45; 1888.

Mimuloria ducilla Chamberlin, Bull. Univ. Utah, 30(2): 7; 1939.

Dynoria parvior Chamberlin, Proc. Biol. Soc. Wash., 60: 10; 1947.

After examination of Bollman's types of *F. georgiana* in the U. S. National Museum, Loomis pointed out¹ that *M. ducilla* was synonymous. Chamberlin's *Dynoria parvior* has been assigned to the wrong genus, and must be placed in *Mimuloria*. The coloration given and the illustration of the gonopod of *parvior* show it to be *georgiana*. It is assumed that

the length of 18-19 mm. given for *parvior* is for greatly telescoped preserved specimens, as no xystodesmids are recalled that are so disproportionately short in comparison with a width of 7 mm. Broken specimens of *georgiana* collected in 1940 at Pelham, Alabama, by Clarence and Marie Goodnight measure up to 9 mm. in width, and specimens reported by Loomis¹ ranged from 6 to more than 8 mm. The gonopods of these specimens exhibited variations approximating the slight differences shown in Chamberlin's illustrations of *ducilla* and *parvior*.

(Genus *Nannaria* Chamberlin)

Psyche, 25: 124; 1918.

Nannaria ohionis, new name

Fontaria castanea Williams and Hefner, Bull. Ohio Biol. Survey, No. 18, p. 106; 1928 (*nec Polydesmus castaneus* McNeill, 1887).

The gonopod of *Fontaria castanea* figured by Williams and Hefner (*op. cit.*, fig. 9b) does not suggest conspecificity of their form with the *castanea* of McNeill.² Actually, it is representative of an unnamed form of *Nannaria*, and is distinctive in the subterminal tooth on the mesial process. No locality is given other than that implied by inclusion of the species as a member of the Ohio fauna.

Nannaria terricola (Williams and Hefner)

Fontaria terricola Williams and Hefner, Bull. Ohio Biol. Survey, No. 18, pp. 106-07, fig. 9c; 1928.

The size and color of this species, as stated by the describers, as well as the nature of the gonopods, necessitates the above generic placement.

Genus *Pachydesmus* Cook

Ann. N. Y. Acad. Sci., 9: 5, 1895.

Pachydesmus clarus (Chamberlin)

Fontaria clara Chamberlin, Ann. Ent. Soc. Amer. 11: 372; 1918.

Pachydesmus kisatchinsis Chamberlin, Bull. Univ. Utah, 32(8): 4; 1942.

Since Chamberlin did not illustrate the gonopods of his *F. clara*, it was not until a paratype male in the collection of the Museum of Comparative Zoology was examined that it became evident the species should have been assigned to the genus *Pachydesmus*. The comparison of drawings of the gonopods of the paratype with that used to illustrate *P. kisatchinsis* shows that but a single species is involved with the older name taking priority.

Genus *Zinaria* Chamberlin

Bull. Univ. Utah, 30(2): 4; 1939.

Zinaria brunnea (Bollman)

Fontaria virginienensis brunnea Bollman, Amer. Nat., 21: 82; 1887.

Zinaria urbana Chamberlin, Bull. Univ. Utah, 30 (2): 5; 1939.

Zinaria iowa Chamberlin, Can. Entom., 74: 16; 1942.

¹Bull. Mus. Comp. Zool., 92 (7): 402; 1943.

²Proc. U. S. Nat. Mus., 10: 329; 1887.

The gonopods of one of Bollman's specimens of *brunnea* in the U. S. National Museum have been drawn. The original description of the species gives 25 mm. as the length, thus the length of 29 mm. given by Chamberlin for *urbana* does not justify the maintenance of that species as distinct from *brunnea*, especially since the gonopods are apparently identical. *Z. iowa*, as described and figured, differs in no particulars from *brunnea*.

Family *POLYDESMIDAE*

Genus *Dixidesmus* Chamberlin

Bull. Univ. Utah, 34(6): 18-19; 1943.

Dixidesmus branneri (Bollman)

Polydesmus branneri Bollman, Proc. U. S. Nat. Mus., 10: 620-21; 1887.

Polydesmus conlatus Chamberlin, Proc. Biol. Soc. Wash., 56: 36; 1943.

Dixidesmus christianus Chamberlin, Proc. Biol. Soc. Wash. 59: 142; 1946.

Comparison of Chamberlin's drawings and descriptions of *conlatus* and *christianus* with those given by Loomis³ for *branneri*, as well as with specimens of the latter necessitates the above synonymy. *P. conlatus*, described from the Great Smoky Mountains, is typical *branneri*, and it is felt that *D. christianus* (from southern Mississippi) is based on minor differences in the male gonopods which represent only individual variation of a sort to be noted elsewhere in series of *branneri* from the southern Appalachians.

Family *STIODESMIDAE*

Genus *Heteropente* Loomis

Bull. Mus. Comp. Zool., 75(9): 360-61; 1933.

Heteropente planifrons Loomis

Heteropente planifrons Loomis, loc. cit.

Styraxodesmus cubensis Chamberlin, Proc. Acad. Nat. Sci. Phila., 99: 21-22; 1947.

Similarities of the description and figure of *Styraxodesmus cubensis* with the descriptoin and figure of *Heteropente planifrons* led to an examination of the type specimen of the former⁴ when it was found that carinal pores are present on segments 5, 7, 10, 13, and 16. Therefore, the species must be removed from *Styraxodesmus* (pore formula 5, 10, 13, 16) and placed under *Heteropente*. Furthermore, *cubensis* is a synonym of *H. planifrons*.

³Bull. Mus. Comp. Zool., 92 (7): 405; fig. 16; 1943.

⁴Acad. Nat. Sci. Phila., Type No. 9942, examined through the courtesy of Dr. J. A. G. Rehn.

PROCEEDINGS
OF THE
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TWO NEW STARFISHES AND A NEW BRITTLE-STAR
FROM FLORIDA AND ALABAMA

By AUSTIN H. CLARK¹

During a brief visit to Key Largo, Monroe County, Florida, in September, 1947, Mr. Frank B. Lyman collected a few littoral echinoderms which he generously presented to the U. S. National Museum. Among these were two starfishes representing types not previously known from the Atlantic area. One of these is related to the species of the Indo-Pacific genus *Leiaster*, though it presents so many peculiarities that it may be regarded as representing a distinct generic type. The other is related to a small group of species of the genus *Ophidiaster* quite different from the two Atlantic species of the genus and heretofore supposed to be confined to the Indo-Pacific region.

During the investigations of the Fish and Wildlife Service steamer *Pelican* on the southeastern coast of the United States many interesting echinoderms were collected, among them a new species of the genus *Asteroporpa* most closely related to one from southeastern Australia and another from southern Japan. This is described beyond.

Among the other captures of special interest were the type specimen of *Luidia bernasconiae* A. H. Clark, related to a west African species; a large number of specimens of *Thyraster serpentarius* (Müller and Troschel), a starfish previously known from only a very few examples, which was dredged at many stations from Savannah, Georgia, south to Ormond, Florida, and also off Mobile, Alabama, and Cameron, Louisiana, in from 8 to 33 fathoms; and some specimens of *Arbacia punctulata* (Lamarek) which were bright olive green in color with white spines, from off Cape Canaveral, Florida, in 8 fathoms. Heretofore the green color was supposed to be characteristic of, and confined to, *Arbacia dufrenoyi* (de Blainville) of southern South America and the Falkland Islands, and *A. crassispina* Mortensen of Tristan da Cunha.

Copidaster, gen. nov.

Diagnosis.—A genus of Linckidae with 5 slender cylindrical rays having a rigid skeleton and covered with a thick smooth skin that wholly conceals the underlying features; the abactinal plates are in

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regular longitudinal and transverse series; there are 7 longitudinal series throughout most of the ray, becoming 9 near the tip; the papular areas are large, in 8 series; there is one small madreporite; the adambulacral plates alternate large and small; in the proximal half of the rays alternate actinals are connected with the marginals by two plates, arranged tandem; the whole animal is completely covered with imbricating scales, very small on the papular areas becoming larger on the plates and largest on their summits; small clasp-knife pedicellariae are very abundant, on the abactinal as well as on the actinal surface.

Genotype.—*Copidaster lymani*, sp. nov.

Range.—Known only from southern Florida.

Comparisons.—This new genus appears to be most closely related to *Leiaster* which it resembles in its thick skin and in its adambulacral armature and pedicellariae. It differs from *Leiaster* in its complete covering of minute imbricating scales, in the occurrence of two plates instead of one between alternate actinals and marginals in the proximal half of the rays, and in the conspicuous alternation in size of the adambulacral plates.

***Copidaster lymani*, sp. nov.**

Description.—R = 85 mm., r = 9 mm.; the five slender cylindrical rays are 11 mm. broad in the middle; in life they are covered with a thick smooth skin that conceals the underlying features.

There are 7 series of marginal and abactinal plates in the earlier portion of the rays. The carinal and marginal rows, which consist of about 45 plates (about the same number as in *Leiaster teres* of equal size) remain straight and regular to the arm tips. At about 20 mm. from the arm tips the row on each side of the carinals becomes irregular, and imperfectly and irregularly doubled; at about 20 mm. from the arm tips this confusion resolves itself into two regular rows on each side, making 9 rows in all. The plates are T-shaped rather than trilobate, the three arms being narrower than the three lobes of the plates of *Leiaster teres*, with approximately parallel sides and broadly rounded ends. They are considerably smaller than the papular areas between them. In *L. teres* they are of about the same size as the papular areas. Beyond the ends of the arms of the plates of the carinal row there is occasionally a small plate connecting the plate of the carinal row with the corresponding plate of the row on either side, as in *L. teres*. The stem and arms of the T are convex so that the ray shows 7 longitudinal ridges connected by numerous lower transverse ridges.

All the plates are completely covered with an investment of flattened scale-like granules imbricating outward and upward from the papular areas, distinctly suggesting the scales on the wing of a butterfly. They are very small on the papular areas, becoming larger on the plates. On the summit of the plates there is a group of from 6 to 20 (commonly about 15) similar but very much larger scales. In *Leiaster teres* the very few granules are lenticular and are embedded in the skin of the papular areas.

There are 8 series of papular areas. These are large and include from 12 to 20 (usually about 15) papulae. Near the tips of the rays these

decrease in number until there are only one or two, and usually none in the submarginal row.

Pedicellariae are exceedingly numerous. On the disk there are from 1 to 4, most commonly 2 or 3, in each papular area, usually situated on the margin. In the proximal third of the rays there are usually 2 pedicellariae in each papular area, one on each side; in the middle third there is usually only one, though sometimes more; and in the distal third the pedicellariae become scattered, although they persist almost to the extreme tip. In the interbrachial areas on the actinal surface they are even more numerous than on the abactinal surface. Beyond the row of contiguous outer adambulacral spines there are frequent pedicellariae situated between the furrow spines and those of the outer row and usually alternating with the spines in the latter. Some of these pedicellariae are much smaller than usual. These pedicellariae persist to about the end of the basal third of the rays.

The pedicellariae are small. The alveolae in which they are situated are about 1 mm. long, narrowly rhombic, mostly about 3 times as long as broad, with sharply pointed ends. The thin lateral borders, which in the dried specimens stand well above the general surface, in life can be brought together, completely concealing the enclosed pedicellaria. The jaws of the pedicellariae are about 0.3 mm. long. They are Y-shaped, the very slender stem of the Y, which ends in a sharp point, being half again as long as the distance across the somewhat thickened arms of the Y-shaped base. The jaws of the pedicellariae are laterally compressed so that in lateral view they are 4 or 5 times as long as their height at the base. They are straight and of uniform width in the proximal half, in the distal half tapering slightly and ending in a recurved glassy hooked point. Along the upper edge there are a few rounded glassy teeth. They closely resemble the blade of a clasp-knife, except that when folded back into the alveola the cutting edge is outward instead of inward.

The pedicellariae of *Leiaster teres* are of the same general type, but they are much fewer, confined to the actinal surface where there are about 6 in each interbrachial area, and the jaws appear to be straight, thicker, and without the hooked tip. The alveolae in *L. teres* are usually straight, but they may be obtusely angled in the middle.

The adambulacral plates are at right angles to the ambulacral groove. The first 15 or 16 are of the same size; those following alternate large and small, the larger ones being more than twice as broad as the smaller.

Following the adambulacral plates there is a continuous row of contiguous irregularly rounded actinal plates, one over each adambulacral. If these happen to be out of line so that there is a suture between two actinals above an adambulacral, the adambulacral is usually followed by a small plate intercalated between the lower angles of the actinal plates.

Following every alternate actinal plate in the proximal half of the arm are two plates connecting the actinals with the marginals. The plate adjacent to the actinals is broader than long, and the lower border, adjacent to the actinals, is more or less bilobed. The plate between this and the marginal is narrower, longer than broad, with broadly rounded ends. Its lower (adambulacral) end imbricates over the upper end of the preceding plate, and its upper end is overlapped by

the lobe of the marginal. In the distal half of the rays this upper plate disappears, and the lower plate becomes smaller and narrower and loses its two-lobed character. Only the plates of the row adjacent to the actinals are present in *Leiaster teres*.

Each adambulacral plate carries 2 long furrow spines of equal size with parallel sides and a broadly rounded tip. These are similar to the 3 furrow spines of *Leiaster teres*, but broader. On the outer end each of the 15 or 16 proximal adambulacrals bears a much larger roundedly pointed spine, each of these spines being in contact with that following. Beyond this point similar spines occur on alternate adambulacrals. Between this row of spines and the furrow spines there are numerous non-contiguous scale-like granules imbedded in the skin.

The spines on the jaw plates continue the series of furrow spines and are not distinguishable from them.

The color (dry) is brown.

Type.—Cat. No. E. 7177, U. S. National Museum, from the outer reefs of Key Largo, Florida, collected by Frank B. Lyman in September, 1947.

Notes.—The type specimen of *Copidaster lymani* was examined by Professor Walter K. Fisher of Pacific Grove, California, and a photograph of it, accompanied by a detailed description, was studied by Dr. H. Engel of Amsterdam. I am much indebted to these two gentlemen for their comments.

The chief character distinguishing *Copidaster* from *Leiaster* is the complete covering of imbricating scales. Of somewhat less significance are the strong alternation in size of the adambulacrals, and the occurrence of two plates joining the actinals and marginals in the proximal half of the rays.

Ophidiaster bayeri, sp. nov.

Description.— $R = 15$ mm., $r = 4$ mm.; the arms are almost cylindrical slowly tapering distally, 3 mm. broad in the middle.

There are seven series of slightly tumid abactinal and marginal plates. These plates are slightly trapezoidal with broadly rounded angles, through the coating of granules appearing oblong, slightly longer than broad. They are arranged in regular longitudinal and transverse rows, each longitudinal row consisting of about 17 plates.

All the plates are completely covered with an investment of contiguous, or almost contiguous, roughened granules which are often higher than broad with an abruptly rounded tip. On the marginals these granules tend to be higher than on the abactinal surface, and they are also somewhat flattened. Each marginal bears in its center a conspicuously larger and higher tubercular granule or low tubercle, in the proximal portion of the rays usually 2 or 3. Each abactinal plate carries from 1 to 4 abruptly enlarged granules similar to those on the marginals though not so conspicuous.

The papular areas are in 8 series. They are small, including usually 3 papulae, sometimes, especially toward the ends of the rays, only 1 or 2.

There are no pedicellariae.

The adambulacral plates are strongly oblique, making an angle of nearly 45° with the ambulacral groove, with the inner ends more distal than the outer. They are all of the same size.

Following the adambulacral plates there is a continuous row of somewhat irregularly rounded contiguous actinal plates, one to each adambulacral. Alternate actinal plates are followed by a slightly smaller plate broader (parallel to the axis of the ray) than long that connects alternate adambulacra with the marginals. In one case there is a very small supplementary plate intercalated between one of these plates and the marginal. These connecting plates are often, perhaps usually, displaced proximally so that they are situated over the line of union between two actinals.

Each adambulacral plate carries two furrow spines which are about twice as long as broad, strongly flattened with parallel sides and a broadly and evenly rounded tip. The distal is slightly smaller than the proximal, becoming markedly smaller in the distal portion of the rays. Just behind the furrow spines each adambulacral carries on the actinal surface a flattened spine similar to the larger furrow spine but about half again as large. On its outer end each adambulacral carries a much larger and stouter spine, broad and somewhat flattened with a rather sharply rounded tip. There are usually no granules between the furrow spines and those of the next row, but there may be one, on one or on both sides, between the outer edges of the spines of the second row and the furrow spines. The spines on the outer ends of the adambulacral plates are separated from those of the second or middle row by usually two rows of granules, but they lie closely against the spine of the middle row of the next following plate.

Each jaw plate carries 4 spines resembling the furrow spines but somewhat larger and more slender.

The color (dry) is brownish white, lighter below.

Type.—Cat. No. E. 7176, U. S. National Museum, from the outer reefs of Key Largo, Florida, collected by Frank B. Lyman in September, 1947.

It gives me much pleasure to name this species for Mr. Frederick M. Bayer who has presented the U. S. National Museum with many fine specimens of echinoderms from Florida and from Biak Island.

Comparisons.—The three rows of spines on the series of adambulacral plates distinguish this species at once from the two other species of *Ophidiaster* known from the Atlantic, *O. ophidianus* on the east coast and in the Mediterranean, and *O. guildingii* in the Caribbean region.

Five species of this general type are known from the Indo-Pacific, *O. granifer* Lütken, *O. tuberifer* Sladen, *O. ornatus* Koehler, *O. pusillus* Müller and Troschel, and *O. triseriatus* Fisher. *Ophidiaster bayeri* is distinguished from *O. tuberifer*, *O. granifer*, and *O. pusillus* by the absence of pedicellariae. From *O. triseriatus* it is distinguished by not having the abactinal and marginal plates tumid or nodose with a naked central area, and from *O. ornatus* it is distinguished by not having the spines on the adambulacral plates separated by granules, and by having the spines of the two outer rows more or less alternating instead of in transverse pairs; also, the plates are less tumid, and the tubercular granules are less conspicuous.

When this specimen was received Professor Walter K. Fisher was visiting the National Museum, and I have to thank him for many helpful suggestions in regard to its relationships.

Three species of *Ophidiaster* in addition to *O. guildingii* have been

described from the southeastern coast and the Caribbean Sea, all from deep water. These are *O. floridæ* Perrier, 1881; *O. alexandri* Verrill, 1915; and *O. pinguis* H. L. Clark, 1941. These represent different stages in the development of the species described by Dr. Hubert Lyman Clark in 1921 as *Hacelia superba*, and are all synonyms of *Hacelia floridæ* (Perrier).

Genus *Asteroporpa* Oersted and Lütken

Remarks.—The discovery in the Gulf of Mexico of a new species of *Asteroporpa* representing a group of species heretofore known only from the west Pacific is interesting, though in view of the paucity of our knowledge regarding the species of the subfamily Astrochelinae it is not especially surprising.

The first known species of *Asteroporpa* was described by Oersted and Lütken in 1856 from the West Indies under the name of *Asteroporpa annulata*. In 1859 Professor Lütken described a second species from the West Indies which he called *A. affinis*. In 1862 Dujardin and Hupé redescribed these two species and added a third, *A. dasycladia*, from Guadeloupe.

Theodore Lyman in 1882 recognized *A. annulata* and *A. affinis*, placing *A. dasycladia* as a synonym under *A. annulata*.

In 1909 Dr. Hubert Lyman Clark described *A. australiensis* from a single specimen from off Wollongong, New South Wales, and in 1911 he described *A. hadracantha* from 22 specimens from various localities off southern Japan.

In a survey of the species of *Asteroporpa* published later in 1911 Dr. Ludwig Döderlein recognized four species, *annulata* (with *dasycladia* as a synonym), *affinis*, *australiensis*, and *hadracantha*. Dr. H. L. Clark in 1915 recognized as valid species *annulata* (with *affinis* and *dasycladia* as synonyms), *hadracantha*, and *australiensis*, and described a new species, *A. pulchra*.

From the material at hand it would seem that *annulata* and *affinis* are quite distinct. In *annulata* the radial shields are narrow so that the arms appear to be continued inward to near the center of the disk, the transverse elevated bands on the arms and radial shields are broad, as broad as the interspaces between them, and the oral side is completely covered with granules, which are much larger in the interradial regions than elsewhere; whereas in *affinis* the radial shields are broad, much broader than the arm bases, the transverse elevated bands on the arms and radial shields are narrow, much narrower than the interspaces between them, and the oral side is sparsely granulated, the granules in the interradial areas not differing appreciably from the others.

In these features *A. affinis* appears to be quite constant, though it is variable in others. For instance, there are usually five bands of enlarged granules across the radial shields, but there may be as many as eight or nine; usually the three outer bands across the radial shields are hook-bearing, but sometimes only the outermost bears hooks; and, though usually regular, some of the bands may be interrupted, or represented only in part. The granules in the central portion of the disk are usually rounded and smooth, but more or fewer of them may be pointed and tipped with a slender spine. The color varies from very dark with the elevated ridges whitish in strong contrast to uniform light dull yellowish.

Asteroporpa lindneri, sp. nov.

Diagnosis.—A species of *Asteroporpa* in which the hook-bearing transverse ridges on the radial shields and arms are bordered on each side by a continuous row of contiguous enlarged granules and are slightly elevated above the general surface of the disk and arms; the radial shields are crossed in the outer portion by three bands of hook-bearing granules; and the granulation is coarse, the inner bands crossing the radial shields being composed of usually a single row of globular granules which are much larger than those on either side, while the inter-spaces between the bands are broader than the bands themselves.

Description.—The disk is 12 mm. in diameter and the arms are about 75 mm. long. The pairs of radial shields are 4.5 mm. broad at their outer ends, tapering to 1 mm. in breadth at their inner ends near the center of the disk. On the periphery of the disk the interradial margins are deeply concave, reaching a depth of 2 mm. within a line connecting the ends of two adjacent pairs of radial shields. On the aboral surface the interradial areas are deeply sunken so that the radial shields rise high above them. From a width of 2 mm. they taper inwardly to a point between the inner ends of the pairs of radial shields.

The arms at the base are narrower than the outer ends of the pairs of radial shields, about 3 mm. broad. They are considerably lower than the outer ends of the radial shields, which are curved broadly downward to them. The arms taper moderately for about the first 20 mm., then progressively more gradually to the extremely slender and almost filiform tip.

The entire surface of the animal is covered with rounded granules. In the interbrachial areas on the aboral side these granules are low, some convex and some flattened, and of different sizes and shapes, forming a sort of mosaic pavement. There is a tendency for rather large flattened granules to be surrounded by a circlet of much smaller and more globular ones forming a sort of reticulation, but this is not very regular. In a broad band around the edge of the disk the smaller elevated granules become more numerous, so that here the granulation appears somewhat more dense. On the lateral surface of the disk and in the interradial angles on the oral surface the small granules increase considerably in size so that there is little difference between them and the larger ones, and here both are more or less strongly convex.

The oral surface of the disk is covered with a fairly uniform investment of approximately hemispherical granules which are considerably smaller than those on the adjacent portions of the interradial areas. They are mostly of about the same size with a few smaller ones intermixed, but become very small on the mouth plates. On the oral side of the arms after the second group of arm spines they become smaller, more irregular in size, and more scattered, after the proximal third of the arms becoming very small and widely scattered. In the distal portion of the arms they are very small and few in number.

On the pairs of radial shields on the aboral side the granules increase in size from the inner to the outer ends. The radial shields are crossed by five bands of enlarged granules of which the three outer are double. The innermost band consists of a single or partially double row of large, high, usually rounded pointed granules which is bordered on each side

by smaller but similar ones. The second band consists of a usually more regular single row of large high granules bordered on each side by a row of smaller ones. Between the first and second and second and third bands is a pavement of much smaller rounded tubercles. The three outer bands consist of two regular transverse rows of large granules between which are two rows of smaller though equally high granules each of which bears on its elevated summit a glassy hook. The granules between the third and fourth bands are larger than those between the first and second and second and third bands, and those between the fourth and fifth bands are nearly as large as the granules of the bands themselves.

Above each pair of side arm plates the arm is crossed by a band consisting of two regular transverse rows of enlarged and rounded granules between which is a double row of smaller but somewhat higher granules, each with a glassy hook at the summit. These bands are separated by an irregular single or more or less double row of smaller and lower granules. There is at best little difference between the granules of the bands and those between them, and often none so that the double rows of hook-bearing granules are simply separated by three or four more or less irregular rows of similar low polygonal granules. Distally the granules become smaller and the double rows of hook-bearing granules higher and more prominent. In the terminal portions of the arms the granules are reduced to small delicate flat plates with the hook-bearing bands standing up conspicuously above them, forming more or less high collars across the arms.

The hooks are crescentic with the lower horn of the crescent usually rounded and swollen; the attachment is by a broad base near the lower horn. Many of them agree with the hooks of *Asteropora annulata* as figured by Döderlein. They are rather variable. Usually they are slender and sharply pointed, but they may be stout, especially in the lower two-thirds. The concave side of the crescent is frequently extended by a thin flange with a straight or slightly concave outer edge that extends from the lower horn nearly to the upper point. There is frequently an accessory point a little more than half way from the lower to the upper horn. This is usually small, but may be long and slender or short and broad. Occasionally it forms the upper border of the filmy extension of the inner side of the crescent.

The first tentacle pore is without any tentacle scales (or arm spines). The second has just below it, and extending outward to the edge of the arm, a comb of 3-5 (usually 4) short, stout, subequal spines each with one or more slender and sharp spinules at the tip. Beneath the next pore is a comb of 4 or 5 similar spines. After about four pores the outermost, or outer two, spines become transformed into tubercles bearing articulated crescentic glassy hooks resembling in general those of the aboral surface of the arm, so that there are only three spines. Later other spines become modified so that finally only the innermost spine is left, and in the terminal portion of the arm all the spines are transformed into tubercles topped by glassy hooks.

Color, dried from alcohol, brownish white, slightly darker and more yellowish below, the interradial areas grayish.

Type.—Cat No. E.7178, U. S. N. M., from *Pelican* station 137-1, in the Gulf of Mexico southeast of Mobile, Alabama (lat. 29° 30.0' N. long. 87° 29.5' W.); 49 fathoms; March 1, 1939.

It gives me much pleasure to name this species for Dr. Milton J. Lindner who when in charge of the investigations by the *Pelican* assembled an unusually interesting collection of Caribbean echinoderms.

Comparisons.—This new species belongs to that section of the genus in which the hook-bearing transverse bands are bordered on each side by a regular row of enlarged granules. Heretofore species of this section were known only from *Thetis* station 48, off Wollongong, New South Wales, in 55-56 fathoms (*A. australiensis*), and from *Albatross* stations 3727, 3730, 3764, and 4936, off southern Japan, in 34-103 fathoms (*A. hadracantha*). The new species appears to be most closely related to *A. hadracantha* from which, however, it is easily distinguished by its coarser granulation.

KEY TO THE SPECIES OF ASTEROPORPA

*a.*¹ Transverse double bands of hook-bearing granules on the arms standing up as high narrow ridges which are about as broad as, or narrower than, the intervals between them, and are not bordered on each side by a regular row of contiguous enlarged granules; hooks large, usually with a long accessory tooth

*b.*¹ All the transverse bands of enlarged granules on the arms bear a double row of minute glassy hooks

*c.*¹ Pairs of radial shields narrow with the sides almost parallel but little broader at the outer ends than the arm bases, separated by depressed interbrachial triangles that run inward to an apex between their inner ends; elevated hook-bearing ridges about as broad as the intervals between them; granulation below dense, forming a complete plating, the granules in the interradial areas larger than the others, sharp tipped, and rather widely scattered *annulata*

*c.*² Pairs of radial shields broad, very obliquely wedge-shaped or almost triangular, the outer angles nearly contiguous and the outer ends much broader than the arm bases; interbrachial granulation narrow and not extending inward so much as half way to the inner ends of the radial shields; elevated hook-bearing ridges on the arms narrow, about half as broad as the intervals between them; granulation below very sparse, the granules widely scattered, and uniform.

affinis

*b.*² On the arms double transverse bands of enlarged granules bearing hooks alternate with single transverse bands of granules without hooks *pulchra*

*a.*² Transverse double bands of hook-bearing tubercles on the arms bordered on each side by a regular row of contiguous enlarged granules, the quadruple bands composed of enlarged and hook-bearing granules only slightly elevated above the general surface of the arms and much broader than the intervals between them; hooks much smaller, usually without an accessory tooth

*b.*¹ Radial shields with a single band of hook-bearing granules along the distal border; four broad and conspicuous bands of enlarged granules across the radial shields, followed inwardly

by a much narrower and irregular one; color conspicuously contrasting, dark with the bands of enlarged granules light

australiensis

b.² Radial shields with three bands of hook-bearing granules across the outer portion; five to seven bands or rows of enlarged granules across the radial shields; color nearly or quite uniform

c.¹ Granulation coarse, the radial shields crossed by usually five bands of enlarged granules of which the three outer are double, enclosing a double row of hook-bearing granules; two inner bands crossing the radial shields each composed of a single more or less regular row of globular granules which are much larger and higher than those on either side, these bands narrower than the interspaces between them

lindneri

c.² Granulation fine, the radial shields crossed by seven bands of enlarged granules of which the three outer are double, enclosing a double row of hook-bearing granules; four inner bands of enlarged granules crossing the radial shields composed of several irregular rows of granules which are not much larger than the granules between the bands, these bands much wider than the interspaces between them

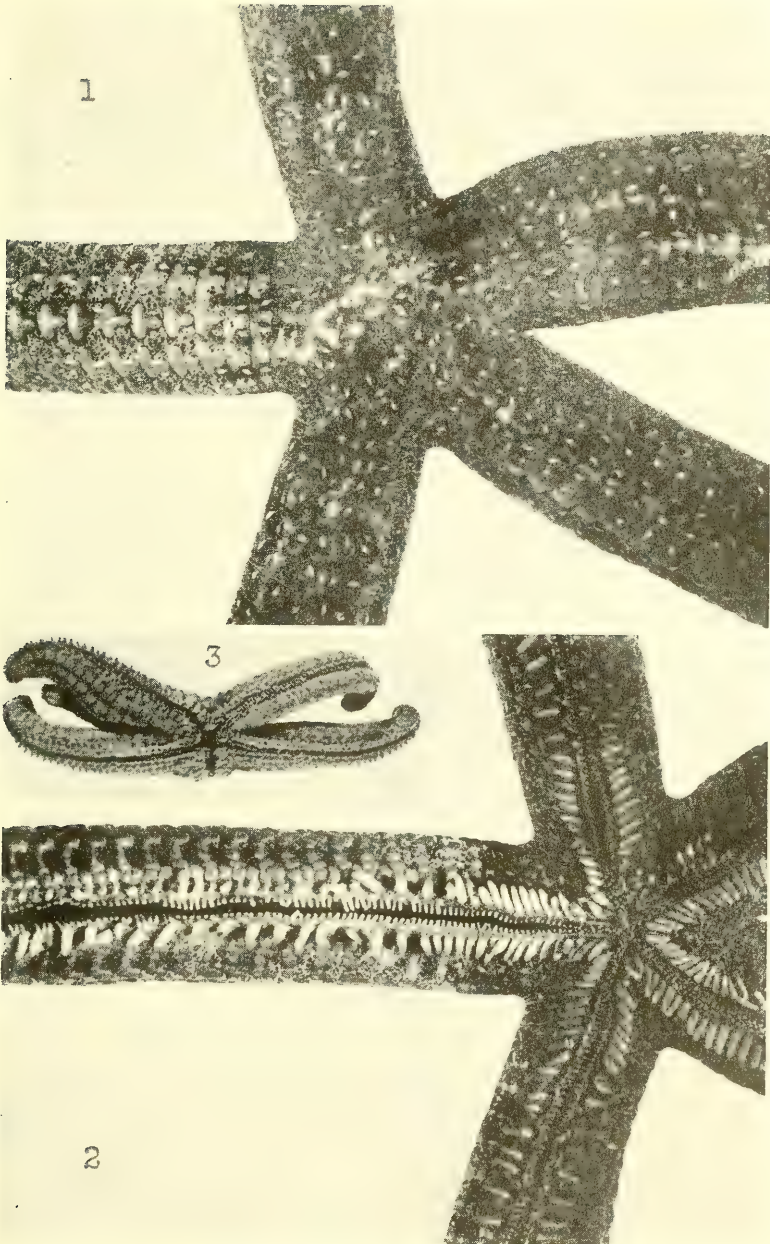
hadracantha

EXPLANATION OF PLATE

FIGURE 1.—*Copidaster lymani*, gen. et sp. nov., abactinal view; the ray on the left has been partially cleaned to show the plates; the type specimen, x 2.

FIGURE 2.—*Copidaster lymani*, actinal view; the ray on the left has been cleaned; the type specimen, x 2.

FIGURE 3.—*Ophidiaster bayeri*, sp. nov.; the type specimen, x 2.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A RACE OF *URUBITORNIS SOLITARIA* FROM
NORTHWESTERN MEXICO

BY A. J. VAN ROSSEM

The great, eagle-sized black hawk, the "Solitary Harpy," has heretofore been known as a very rare bird with a range in South America from Chile, Peru, and Ecuador north to Colombia. Occasional presumed stragglers have been taken in Central America north to the Isthmus of Tehuántepec, although these seem all to have been young birds.

My friends W. J. Sheffler and E. N. Harrison, during a field trip in the mountains of southeastern Sonora in the spring and summer of 1947, followed up native reports of a "black eagle" and collected the female of a breeding pair of *Urubitornis solitaria*. Since they are preparing a report on what they learned of the life history of this species I shall not anticipate their account with further details. In February and early March of the present year, Sheffler and I were in the mountains some thirty miles north of the initial locality of capture and again heard reports of *Urubitornis*. Greatly to our delight a native hunter brought in to our camp an adult male, thus providing two specimens for comparison with South American examples.

The courtesy of the United States National Museum has made possible a comparison of the Sonora birds with an adult male from Colombia and a juvenile of unknown sex from Guatemala. That some differences are present is not surprising in view of the roughly 2,500 miles of intervening territory. I take pleasure in naming the northern race for Mr. Sheffler, not only because he is the initial discoverer but because he has for several years made available for my use his collections and observations on many species of Sonora birds.

Urubitornis solitaria sheffleri new subspecies
Northern Solitary Harpy

Type.—Breeding female adult, No. 2666, collection of W. J. Sheffler; extreme southeastern Sonora near the Chihuahua boundary, June 7, 1947; collected by W. J. Sheffler.

Subspecific characters.—Larger than *Urubitornis solitaria solitaria* (Tschudi) of South America, this being reflected not only in linear measurements but in the more massive size of the tarsi and feet. Anterior upper parts (mantle and shoulders) darker and close to "Blackish Slate" instead of "Slate Color." Outer primaries finely mottled or variegated instead of barred on their basal portions. Tail with a second sub-basal white band about 10 to 12 millimeters wide across both webs of outer pair of rectrices, becoming broken and more obscure on next

three inner pairs instead of an ill defined trace on the two outer pairs as in *solitaria*. Under tailcoverts distinctly barred and mottled with grayish white instead of nearly uniform blackish.

Range.—Mountains of extreme southeastern Sonora near the Chihuahua boundary from about Lat. 27° 40' southward.

Remarks.—The references pertinent to *Urubitornis solitaria* may be found in Swann's "Monograph of the Birds of Prey, Vol. 1, p. 477, 1930. To date, published measurements mean little, since in no case is there any indication whether the wing measurements are for the chord or for the flattened wing and some, at least, of the tail measurements must have been taken from the uropygium and not from the point of insertion of the central pair of rectrices. Measurements taken by me are for the chord of wing, tail from the point of insertion of the central pair of rectrices, culmen (chord) from the anterior edge of the cere, depth of bill at the anterior edge of cere, and tarsus and middle toe without claw in the universal manner.

	Wing	Tail	Culmen	Depth	Tarsus	Middle Toe	
♂ ad. ¹	490	220	42.0	26.0	127	61	<i>U. s. solitaria</i>
♂ [?] ² juv.	490	[225]	38.5	—	118	57	<i>U. s. solitarai</i>
♂ ad. ³	530	252	39.5	27.2	132	62	<i>U. s. sheffleri</i>
♀ ad. ⁴	552	260	43.6	28.5	131	66	<i>U. s. sheffleri</i>

¹U. S. Nat. Mus., Sierra Perija, Dept. Magdalena, Colombia, March 20, 1942. 372359.

²U. S. Nat. Mus., San Gerónimo, Guatemala. No date. 49656. Apparently in this species, as in many Buteonids, the juvenile tail has narrower and longer rectrices than that of the adult.

³Sheffler Coll. Southeastern Sonora, Mexico, March 1, 1948. 2761.

⁴Sheffler Coll. Southeastern Sonora, Mexico, June 7, 1947, 2666. Type.

Colors of soft parts.—In the Sheffler specimens: iris, reddish brown; bill, dull, plumbeous black, dull yellow on basal non-corneous portions of mandibular rami; cere, semi-nude anterior part of facial region, eyelids, tarsi, and feet, approximating the "Light Orange Yellow" of Ridgway, 1912; claws black.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA REDISCOVERED HAITIAN RODENT,
PLAGIODONTIA AEDIUM, WITH A SYNOPSIS
OF RELATED SPECIESBy DAVID H. JOHNSON*
U. S. National Museum

Hutias of the genus *Plagiodontia* are apparently rare in a living state, although their remains are common in cave and kitchen-midden deposits from the island of Hispaniola. Along with *Capromys* of Cuba and *Geocapromys* of Jamaica and certain other West Indian islands, they represent a meager remnant of a once-flourishing Antillean fauna of hystricomorph rodents.

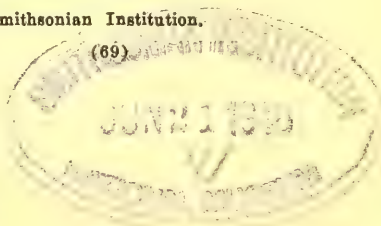
The following seem to be the only living representatives of *Plagiodontia* that have been preserved for scientific study: Two specimens were collected in Haiti in 1830 by Alexander Ricord; one of these was described and illustrated by F. Cuvier (1836) as *Plagiodontia aedium*, and an account of the other under the same name was later given by Gervais (1854, pp. 346-347). Thirteen specimens were obtained in 1923 by W. L. Abbott near Jovero, northeastern Dominican Republic, for the United States National Museum; they were described by Miller (1927) as *Plagiodontia hylaeum*. Two further specimens of the latter species were collected for the Museum of Comparative Zoology by William J. Clench in 1937 (G. M. Allen, 1942, p. 118.) *P. hylaeum* is said by Ellerman (1940, p. 134) to be represented by one specimen in the British Museum.

Among numerous lots of bones and teeth from cave and kitchen-midden deposits in Haiti and the Dominican Republic, Miller (1916a, 1916b, 1927, 1929a, 1929b, 1930) distinguished three species of *Plagiodontia*, referring one to *P. hylaeum*, the second provisionally to *P. aedium*, and describing the third as *P. spelaicum*.

Mr. Anthony Curtiss of Port-au-Prince has recently presented to the U. S. National Museum a freshly preserved hutia collected by himself in February, 1947, near Miragoane on the southwestern peninsula of Haiti. On comparison with Cuvier's original description and illustrations, this specimen proves to be identical with *Plagiodontia aedium*, which had not been collected in more than a century and was believed to have become extinct (see G. M. Allen, 1942, pp. 116-119). In addition to demonstrating that the species still survives in Haiti, this specimen makes possible a direct comparison between *P. aedium* and its congeners. The large

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JUN 18 1948



extinct hutia, which is abundantly represented in the kitchen-midden deposits of coastal Dominican Republic and which has been assumed to represent *P. aedium*, proves to be quite distinct and requires a new name.

The genus *Plagiodontia* is therefore shown to include four species, of which two are living and two are apparently extinct.

The habits of these animals are practically unknown. Mr. Curtiss writes that *P. aedium* of Haiti is called "agouti" in Creole and "is well known to the country people of the region, who have dogs trained to catch it." Dr. Abbott received his Dominican specimens of *P. hylaeum* from an old man who "caught them with dogs in hollow trees down near a lagoon near sea shore." Because of its shorter and blunter claws and shorter feet, *P. aedium* is judged to be more terrestrial and less arboreal than *P. hylaeum*.

SPECIES KNOWN IN A LIVING STATE

Plagiodontia aedium F. Cuvier

Plagiodontia aedium F. Cuvier, 1836, p. 347 (original description and illustrations); Gervais, 1854, pp. 346-347 (description, and figure of teeth); Elliot, 1904, pp. 395-396 (reproduction of Cuvier's illustrations).

Type specimen.—Muséum National d'Histoire Naturelle, Paris, no. 1829, mounted skin with skull separate; collected in Haiti in 1830 by Alexander Ricord (Rode, 1945, p. 293).

External characters (based on U. S. N. M. no. 282552).—Body stout and robust; length of head and body 312 mm.; head broad with blunt muzzle; eye small (length of aperture 8 mm.); pinna of ear short and fleshy, not as long as surrounding fur (extending 9 mm. from crown of head, 18 mm. from notch), nearly bare on inner and outer surfaces but bearing on its rim a fringe of long hairs similar to those on head; muffle bare adjacent to narial slits; tail equal to about one third of total length; furred like body on basal one-sixth, otherwise completely devoid of hairs and scaly; diameter at base of bare area 13 mm. tapering to 4 mm. near tip; scales averaging about 1 mm. in diameter, subcircular and sometimes pentagonal, not overlapping, showing weak tendency to arrangement in transverse or diagonal rows but not forming definable rings. Feet broad and stout; palmar and plantar surfaces completely hairless and bearing flattened scales resembling those of tail but more variable in size, shape, and arrangement; palmar and plantar tubercles virtually absent, indicated only by creases in skin of metapodial areas and by callouses on heels; forefoot with subquadrate palm and reduced thumb, the latter a mere protuberance bearing a nail-like claw, third and fourth fingers longest and practically equal, second finger slightly longer than fifth; hind foot with sole twice as long as broad (46 x 23 mm.) first toe distinct but quite short, second to fourth toes subequal, fifth toe somewhat shorter; claws on all feet blunt and strong, those on each foot approximately equal, claws of forefeet averaging near 6 mm. long, those on hind feet near 9 mm. Vibrissae present on mystacial area (up to 70 mm. long), above and behind eye, and on chin.

Pelage on back and sides composed chiefly of gray-based and whitish-tipped hairs between 30 and 40 mm. long, with a sparse intermixture of

gray underfur and a few longer wholly dark bristles; fur of underparts shorter, whitish basally and tipped with a buffy shade.

Color of fur (after 16 months in alcohol, hence considerably altered from original condition): on back Natal Brown (capitalized color terms are from Ridgway, 1912) heavily sprinkled with Cartridge Buff; sides of head between Pinkish Buff and Cinnamon Buff; underparts Dray-Gray overlaid with Cinnamon-Buff, definitely paler than upperparts.

Cranial characters.—Skull resembling that of *P. hylaeum* in general, but differing from it in detail as follows: smaller, greatest length near 69 rather than 75 mm.); postorbital process of frontal almost obsolete, indicated by slight irregularity in supraorbital ridge rather than forming well defined projection; zygomata more evenly arched, seeming relatively more prominent in maxillary region and less so in squamosal region; rostrum weaker, shallowest part of premaxilla above alveolus of incisor 2.5 mm. rather than 4 to 5 mm. in depth; posterior palatine foramina (palatal pits) a single well defined pair opposite posterior border of M^1 rather than opposite anterior border of that tooth as in *P. hylaeum* (which also has one or two additional pits farther back on the palate); anterior margin of pyterygoid vacuity U-shaped rather than V-shaped and not extending anteriorly beyond level of posterior margin of alveolus of M^3 ; mandible with shallower sulcus between articular and coronoid processes.

Teeth smaller than those of *P. hylaeum*; incisors narrower and relatively longer; occlusal surfaces of cheek teeth smaller; tooththrows more nearly parallel and with less tendency toward reduction in size of posterior teeth; pattern of cutting edges on cheek teeth similar except for presence in *P. aedium* of incipient fold at anterolateral corner of Pm^4 (which is continued as a definite groove down the shaft of the tooth) and the absence in *P. aedium* of a similar fold at the postero-lateral corner of M^3 (which in *P. hylaeum* sets off a distinct accessory process); labial and lingual folds of lower cheek teeth moderately overlapping, their tips less pointed and their sides less sinuous than in *P. hylaeum*.

Measurements.—Total length (from alcoholic specimen with skull removed) 465 mm.; tail 153; hind foot with claw, 67, without claw, 61; ear from notch 18, from crown 9; greatest length of skull 68.7; condylo-basal length 63.3; palatal length 36.1; zygomatic breadth, 39.7; inter-orbital construction 17.5; mastoid breadth 26.1; occipital depth 16.0; median rostral depth 14.5; nasal length 22.4; breadth of combined nasals 9.0; diastema 14.3; greatest length of mandible 52.3; length of mandibular symphysis 22.6 maxillary tooththrow (alveolar) 17.6; lengths of occlusal surfaces of cheek teeth, Pm^4 5.2, M^1 4.2, M^2 4.0, M^3 3.8; mandibular tooththrow (alveolar) 16.5; horizontal expansion of angular process 5.4.

Specimen examined.—One (in alcohol with skull removed and cleaned), from near Miragoane, southwestern Haiti, U. S. N. M. no. 282552.

Plagiodontia hylaeum Miller

Plagiodontia hylaeum Miller, 1927, p. 4.

Type specimen.—U. S. National Museum, no. 239887, male, skin and skeleton; collected at Guarabo, 10 miles east of Jovero, Samana Province, Dominican Republic, November 23, 1923, by W. L. Abbott.

External characters.—As described in detail by Miller (1927, pp. 4-5).

Differing from *P. aedium* in greater size of body (length of head and body of males 348 to 405 as compared with 312 mm.); shorter tail (127 to 146 as compared with 153 mm.); smaller scales on tail and feet; narrower feet with longer and sharper claws; pinna of ear less hairy, its margin more thickened and more evenly rounded; color seemingly darker in general, contour hairs with less contrasting tips, cheeks and underparts essentially similar in color to back rather than distinctly paler, a whitish pectoral spot occasionally present.

Cranial characters.—As described by Miller (*loc. cit.*) and in account of *P. aedium*, above.

Specimens.—A total of 13, including the type (11 skins and skulls with body skeletons, and two in alcohol) from the type locality, U. S. N. M. nos. 239886-898.

Measurements.—See Miller (*loc. cit.*, p. 8).

SPECIES FOUND IN CAVE AND KITCHEN-MIDDEN DEPOSITS

Plagiodontia hylaeum Miller

(Synonymy and characters given above)

Specimens examined.—A total of 35 cranial, mandibular, and dental fragments, as follows: San Lorenzo Bay, Samana Province, Dominican Republic, 13; near Constanza, western La Vega Province, Dominican Republic, 13; cave at Atalaye Plantation, near St. Michel, Haiti, 9.

Miller (1930, p. 4) has also recorded this and an unidentified species of *Plagiodontia* from a deposit in a deep sink hole called the Trujin, on the Massif of La Selle, Haiti. This material has not been re-examined.

Plagiodontia ipnaeum, new species

Plagiodontia aedium, Miller, 1922, p. 4; 1929a, p. 18; 1930, p. 8. (*nec* F. Cuvier, 1836, p. 347).

Type specimen.—U. S. National Museum, no. 254375, median part of skull (lacking most of rostrum and braincase) of adult, sex unknown; collected in kitchen-midden deposit at a Ciguayan village site at Anadel, 2 kilometers east of Samana, Dominican Republic, by Herbert W. Krieger in 1928.

Cranial characters.—Skull (of type specimen) larger than that of any other species of *Plagiodontia*; postorbital processes prominent, but projecting less than in *P. hylaeum*; skull deep; palate constricted anteriorly; palatal pits opposite middle of M¹; pytergoid vacuity broad, its anterior margin obtusely pointed; upper toothrows closely approximated anteriorly, divergent posteriorly; cheek teeth progressively smaller from Pm⁴ to M³, with greatest difference between Pm⁴ and M¹. Mandible (of no. 254380 from the type locality) more massive than in other species; angular process greatly expanded horizontally.

Upper cheek with molar pattern essentially as in *P. hylaeum*, Pm⁴ without anteroexternal secondary fold, M³ with secondary fold on posterior margin; pattern on lower cheek distinguished by failure of labial and lingual folds to overlap.

Measurements.—Skull of type specimen: Interorbital breadth 25.1 mm.; alveolar length of maxillary tooth row 23.3; depth from roof of skull between postorbital processes to posterior edge of palate 20.5 length of occlusal surface of Pm⁴ 6.9, of M¹ 5.4, of M² 5.1, of M³ 4.6. Mandi-

ble of no. 254380: Length of symphysis at least 31; alveolar length of mandibular tooth row 24.4; horizontal expansion of angular process 9.5.

Specimens examined.—A total of 134 cranial, mandibular, and dental fragments from cave and kitchen-midden sites as follows: Anadel, Dominican Republic (type locality), 43; mouth of San Juan River, 10 kilometers north of Samana, Dominican Republic, 59; near Monte Cristi, northeastern Dominican Republic, 18; near Constanza, western La Vega Province, Dominican Republic, 6; San Pedro de Macoris, Dominican Republic, 1; cave at Atalaye Plantation, near St. Michel, Haiti, 7.

Plagiodontia spelaeum Miller

Plagiodontia spelaeum Miller, 1929a, p. 18.

Type specimen.—U. S. National Museum, no. 253160, right mandible; collected in cave near Atalaye Plantation, near St. Michel, Haiti, March, 1925, by Gerrit S. Miller, Jr.

Cranial characters.—Smallest of the species of *Plagiodontia*; in such characters as can be distinguished in fragmentary material resembling *P. hylaeum* rather than other species; palate moderately constricted anteriorly; upper cheek teeth as in *P. hylaeum* but with M^3 relatively smaller; secondary fold on posterior margin of M^3 well developed; labial and lingual folds of lower cheek teeth overlapping about as in *P. aedium*, less so than in *P. hylaeum*.

Measurements.—Length of occlusal surface of Pm^4 4.5 mm., of M^1 4.1, of M^2 3.6, of M^3 3.7; alveolar length of mandibular toothrow (of type) 16.3; mandibular symphysis (of type) 17.8.

Specimens examined.—A total of 32 cranial, mandibular, and dental fragments from the type locality.

KEYS TO THE SPECIES OF PLAGIODONTIA

Based on external characters:

Underparts distinctly paler than upperparts; length of tail near 150 mm.; ear with fringe of long hairs on rim; claws strong and blunt *P. aedium*.

Underparts colored like upperparts except for an occasional pectoral spot; length of tail near 145 mm.; margin of ear bare; claws relatively slender and sharp *P. hylaeum*.

Based on cranial and dental characters:

Skull smaller; alveolar length of mandibular tooth row less than 18 mm.; postorbital processes (at least in *P. aedium*) virtually absent.

M^3 with posterior fold and accessory process, length of its occlusal surface 2.7 mm.; alveolar length of mandibular tooth row 16.3 mm. *P. spelaeum*.

M^3 lacking posterior fold and accessory process, length of its occlusal surface 3.8 mm.; alveolar length of mandibular tooth row 16.5 mm. *P. aedium*.

Skull larger; alveolar length of mandibular tooth row more than 18 mm.; postorbital processes prominent.

Labial and posterior lingual folds of lower cheek teeth overlapping; postorbital processes relatively long and slender; alveolar length of mandibular tooth row near 20 mm. *P. hylaeum*.

Labial and posterior lingual folds of lower cheek teeth meeting without overlapping; postorbital processes blunter; alveolar length of mandibular tooth row near 24 mm.....*P. ipnaeum*.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

CLASSIFICATION OF THE BUTTERFLIES, WITH
THE ALLOCATION OF THE GENERA OCCURRING
IN NORTH AMERICA NORTH OF MEXICO

By AUSTIN H. CLARK*

At the present time there is no classification of the Rhopalocera as a whole available for students of the group. The question of the interrelationships within the various subdivisions is more or less unsettled, and the arrangement of the genera in one family is commonly at variance with that proposed by another author for another family. This is especially true in regard to the relative weight to be given to the supergeneric categories. It has seemed worth while, therefore, to present the following classification of the Rhopalocera in which all the groups are included, and in which the interrelationships of the subfamilies and tribes within each family are comparable with those in other families, at least in terminology.

This classification is admittedly tentative, for in many groups much work remains to be done in regard to the larval, pupal, genitalic and other characters before any definite appraisal of their systematic position is possible.

In the following pages the classification of the Hesperioidea follows the generally accepted plan. The classification of the Riodinidae is that of Dr. H. Stichel. The grouping of the genera in the family Pieridae is that of Dr. Alexander B. Klots, and in the family Danaidae essentially that of Dr. William T. M. Forbes.

In the arrangement of the genera in the family Papilionidae I have followed Dr. E. B. Ford. But the genus *Lamproptera* (*Leptocircus*) is regarded as sufficiently distinct from *Graphium* and its allies to justify its recognition as a distinct tribe, and the genera *Troides*, *Ornithoptera*, *Schoenbergia*, and *Trogonoptera* appear to differ sufficiently from the other genera of Aristolochia-feeding swallowtails to warrant their inclusion in a special subtribe.

The treatment of the genera of the Nymphalides adopted herein was explained in a recent paper (Proc. Ent. Soc. Washington, vol. 49, No. 6, June 1947, pp. 148, 149; No. 7, October 1947, p. 192). This should, perhaps be further clarified by an additional note. The Satyridae, exclusive of the Pronophilinae, Elymniinae, and Pierellinae, appear to fall into two groups. In one group, one or more of the veins of the fore wings are

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abruptly swollen at the base, the hind wings are evenly rounded, and the larvae feed on the smaller grasses. This group is regarded as constituting the subfamily Satyrinae. In the other group none of the veins of the fore wings are abruptly swollen at the base, though they may be gradually thickened, the hind wings are usually more or less conspicuously toothed, and the larvae feed mostly on the sedges or on the coarser grasses such as *Hystrix*, *Arundinaria*, bamboo, sugar-cane, and maize. This group is considered as constituting the subfamily Lethinae (Enodiinae).

The disposition of the genera in the family Lycaenidae is to be regarded as purely tentative. It was drawn up in consultation with Dr. William T. M. Forbes and Mr. William D. Field.

In the preparation of this classification I have been assisted by many co-workers. Chief among these has been my colleague Mr. William D. Field to whom I am deeply indebted for many pertinent suggestions. Dr. William T. M. Forbes was also most generous in giving suggestions and advice. Mr. Ernest L. Bell, Mr. R. C. Williams, and Professor A. W. Lindsey were so kind as to review the arrangement of the Hesperioidea. Dr. E. B. Ford discussed with me the classification of the Papilionidae, and Dr. Norman B. Tindale and I reviewed certain features in the interrelationships of the nymphalids.

CLASSIFICATION OF THE RHOPALOCERA, WITH THE ALLOCATION OF THE GENERA OCCURRING IN NORTH AMERICA NORTH OF MEXICO

Superfamily PAPILIONOIDEA

Group NYMPHALIDES

Family Satyridae

Subfamily Satyrinae (*Coenonympha*, *Eumenis*, *Minois*, *Oeneis*,
Erebia, *Neonympha*, *Megisto*, *Paramecera*)

Subfamily Lethinae (Enodiinae) (*Lethe*, *Satyrodes*)

Subfamily Pronophilinae (*Gyrocheilus*)

Subfamily Elymniinae

Subfamily Pierellinae

Family Brassolidae

Subfamily Brassolinae

Subfamily Caliginae

Subfamily Biinae

Family Morphidae

Subfamily Morphinae

Subfamily Amathusiinae

Tribe Taenarini

Tribe Amathusiini

Tribe Hyantini

Tribe Discophorini

Family Apaturidae

Subfamily Charaxinae (*Anaea*)

Subfamily Aparturinae (*Asterocampa*)

Family Nymphalidae

Subfamily Marpesiinae (*Megalura*, *Marpesia*)

Subfamily Nymphalinae

Tribe Nymphalini (*Polygonia*, *Nymphalis*, *Vanessa*, *Junonia*,
Anartia, *Hypanartia*, *Victorina*, *Hypolimnas*)

Tribe Melitaeini (*Euphydryas*, *Melitaea*, *Chlosyne*, *Phyciodes*,
Anthanassa, *Eresia*, *Microtia*)

Subfamily Ergolinae

Tribe Catagrammini (*Diaethria*)

Tribe Ergolini (*Cystineura*, *Eunica*)

Tribe Epicaliini (*Myscelia*)

Tribe Ageroniini (*Ageronia*)

Tribe Gynaeciini (*Historis*, *Smyrna*)

Family Argynniidae

Subfamily Limenitinae

Tribe Euthaliini

Tribe Limenitini (*Limenitis*, *Heterochroa*, *Dynamine*)

Subfamily Argynninae

Tribe Cynthiini (*Euptoieta*)

Tribe Argynnini (*Speyeria*, *Clossiana*, *Boloria*)

Subfamily Heliconiinae

Tribe Heliconiini (*Heliconius*)

Tribe Dionini (*Agraulis*, *Dryas*)

Tribe Cethosiini

Subfamily Acraeinae

Family Calinagidae

Family Danaidae

Subfamily Danainae

Tribe Danaini (*Danaus*)

Tribe Lycoreini (*Lycorea*)

Tribe Anellini (*Clothildini*)

Tribe Euploeini

Subfamily Tellervinae

Subfamily Ithomiinae

Tribe Melinaeini

Tribe Thyridiini

Tribe Ithomiini

Group LYCAENAE

Family Libytheidae (*Libytheana*)

Family Riodinidae

Subfamily Nemeobiinae

Tribe Nemeobiini

Subtribe Nemeobiina

Subtribe Zemerina

Subtribe Abisarina

Tribe Euselasiini

Tribe Corrachiini

Tribe Helicopini

Subfamily Riodininae

Tribe Eurybiini

Subtribe Semomesiina

Subtribe Eurybiina

Tribe Ancylyurini

Subtribe Ancylyurina

Subtribe Baeotidina (*Caria*, *Calephelis*, *Lasaia*)

- Subtribe Musenina
 - Subtribe Charitina
 - Subtribe Emesina (*Emesis*, *Apodemia*)
 - Subtribe Nymphidiina
 - Tribe Stalactini
 - Family Lycaenidae
 - Subfamily Liphyrinae
 - Subfamily Gerydinae
 - Subfamily Spalginae (*Feniseca*)
 - Subfamily Lipteninae
 - Subfamily Curetinae
 - Subfamily Poritiinae
 - Subfamily Ogyrinae
 - Subfamily Amblypodiiinae
 - Subfamily Lycaeninae
 - Tribe Theclini
 - Subtribe Theclina (*Zephyrus*, *Hypaurotis*, *Atlides*, *Strymon*, *Thecla*, *Calycopis*, *Callipsyche*, *Eupsyche*, *Satyrion*, *Mitoura*, *Incisalia*, *Callophrys*, *Erora*)
 - Subtribe Eumaeina (*Eumaeus*)
 - Tribe Lycaenini
 - Subtribe Lycaenina (*Tharsalea*, *Lycaena*)
 - Subtribe Plebejina (*Leptotes*, *Brephidium*, *Zizera*, *Hemiar-gus*, *Everes*, *Plebejus*, *Philotes*, *Phaedrotes*, *Glaucopsyche*, *Cyaniris*)
- Group PAPILIONES
 - Family Pieridae
 - Subfamily Pseudopontiinae
 - Subfamily Dismorphiinae
 - Subfamily Pierinae
 - Tribe Pierini (*Neophasia*, *Appias*, *Pieris*, *Ascia*)
 - Tribe Rhodocerini (*Colias*, *Zerene*, *Anteos*, *Phoebis*, *Aphrissa*, *Kricogonia*, *Eurema*, *Nathalis*)
 - Tribe Euchloini (*Anthocaris*, *Euchloë*)
 - Family Papilionidae
 - Subfamily Papilioninae
 - Tribe Lampropterini (*Leptocircini*)
 - Tribe Graphiini (*Iphiclides*)
 - Tribe Teinopalpini
 - Tribe Papilionini (*Papilio*)
 - Tribe Troidini
 - Subtribe Battina (*Battus*)
 - Subtribe Troidina
 - Tribe Cressidini (*Eurycini*)
 - Subfamily Zerynthiinae
 - Subfamily Parnassiinae (*Parnassius*)
 - Subfamily Baroniinae
- Superfamily HESPERIOIDEA
 - Family HesperIIDae
 - Subfamily Pyrrhopyginae (*Apyrhothrix*)
 - Subfamily Pyrginae

- Tribe Celaenorrhinini (*Pyrgus*, *Heliopetes*, *Antigonus*, *Celotes*,
Pholisora, *Staphylus*, *Achyloides*, *Xenophanes*, *Ephyriades*,
Chiomara, *Erynnis*, *Timochares*, *Grais*)
- Tribe Eudamini (*Phocides*, *Nascus*, *Polygonus*, *Proteides*,
Urbanus, *Chiodes*, *Codatractus*, *Telegonus*, *Zestusa*, *Achalarus*,
Cecropterus, *Thorybes*, *Cabares*, *Cogia*, *Caicella*)
- Subfamily Hesperinae
- Tribe Heteropterini (*Pamphilida*, *Butleria*)
- Tribe Adopaeini (*Ancyloxypha*, *Oarisma*, *Thymelicus*, *Copaeodes*)
- Tribe Hesperini (*Pseudocopaeodes*, *Yvretta*, *Hesperia*, *Hylephila*,
Atalopedes, *Ochlodes*, *Polites*, *Wallengrenia*, *Poanes*,
Problema, *Atrytone*, *Atrytonopsis*, *Oligoria*, *Lerema*, *Pheimides*,
Amblyscirtes, *Lerodea*)
- Tribe Calpodini (*Thespius*, *Calpodes*, *Panoquina*)
- Subfamily Trapezitinae
- Subfamily Ismeninae
- Subfamily Euschemoninae
- Family Megathymidae (*Megathymus*)

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW CRAYFISH OF THE GENUS *ORCONECTES*
FROM SOUTHERN TENNESSEE(Decapoda, Astacidae)
HORTON H. HOBBS, JR.¹

The new crayfish herein described belongs to the *Limosus* Section of the genus *Orconectes*, and the locality from which it was collected is the most southern record for the epigean members belonging to this section. The previous most southern record for the pigmented species belonging to this assemblage is that of *Orconectes shoupi* Hobbs (1948: 14) which was collected in a tributary of the Cumberland River near Nashville, Davidson County, Tennessee. Among the members of the *Limosus* Section only the cavernicolous *Orconectes pellucidus australis* (Rhoades 1941:142) has been collected farther south—in several caves in northern Alabama—and no species belonging to this section has been taken farther southwest.

Hobbs (1948:20) has constructed a key for the identification of the 13 previously known species and subspecies of this section, and the gonopods of twelve of them are figured in the same paper. A revised key to the nine epigean species is included below.

Genus *Orconectes* Cope 1872
Orconectes wrighti, sp. nov.²

Diagnosis.—Rostrum with small, corneous, lateral spines or tubercles; margins not distinctly thickened and converging; upper surface without median carina, concave and heavily pubescent. Fingers of chela with well defined longitudinal ridges. Epistome with a slight longitudinal median ridge. Areola about six times longer than broad, with four or five punctations in narrowest part—length about 32% of entire length of carapace. Male with hooks on ischiopodites of third pereopods only. Terminal elements of first pleopod of first form male short, reaching almost to coxopodite of second pereopod. Two terminal elements separated for only a short distance near tip, slightly divergent, and subequal in length. Annulus ventralis immovable (see fig. 1 for surface contour).

Holotypic Male, Form I.—Body subovate, not conspicuously depressed. Abdomen narrower than thorax. Width of carapace greater than depth in region of caudodorsal margin of cervical groove (12.2-10.9 mm.).

¹Miller School of Biology, University of Virginia.²This species is named in honor of my good friend, Dr. Mike Wright of Tusculum College. Dr. Wright collected the specimens on which the following descriptions are based, and he has added numerous other invaluable specimens to my collection.

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Areola moderately broad (5.9 times longer than broad) with four or five punctations in narrowest part—punctations crowded and strongly setiferous, particularly in cephalolateral portions; cephalic section of carapace about 2.1 times as long as areola (length of areola about 32.0% of entire length of carapace).

Rostrum with margins only slightly thickened and converging. Upper surface shallowly concave and bearing no median carina. Base of acumen set off by small corneous spines directed cephalodorsad. Acumen of moderate length and ending in a corneous spine which is directed cephalad and does not quite reach distal end of last segment of peduncle of antennule. Subrostral ridges moderately prominent but not visible in dorsal aspect. Entire surface of rostrum heavily pubescent.

Postorbital ridges prominent, shallowly grooved and terminating cephalad in acute corneous spines. Suborbital angle absent. Branchiostegal spine small but well defined. Prominent lateral spine on right side of carapace—that on left broken. Dorsal surface of carapace thickly studded with setiferous punctations with no polished area in gastric region; lateral surface granulate and setiferous.

Cephalic section of telson with two spines in each caudolateral corner.

Epistome bearing a faint median longitudinal ridge and no cephalo-median projection. See fig. 8 for marginal contour.

Antennules of the usual form with a strong spine on ventral surface of basal segment.

Antennae extend caudad to third abdominal segment. Antennal scale of moderate width; mesial margin evenly rounded; outer portion not unusually broad nor swollen, and terminating distad in a well developed spine; lamellar portion of moderate breadth (see fig. 9).

Chela somewhat depressed; palm slightly inflated; much of the sculpture obscured by dense setae. Inner margin of palm with a row of nine small tubercles. Above this row is another of five or six; both rows partially hidden by the dense setae. Fingers not gaping. Upper surfaces of both fingers with two longitudinal ridges, the more median one on each finger more prominent than the one lying next to opposable margin. Lower surfaces of both fingers with a submedian longitudinal ridge. Opposable margin of dactyl with five corneous tubercles along proximal three-fifths—the proximal four knob-like and subequal in size, the distal one smaller, and while knob-like, more nearly acute; distal half with a broad band of minute denticles. Mesial margin of dactyl with a row of setiferous punctations—those along distal half bearing thick tufts of stiff hairs. Opposable margin of immovable finger with five rounded corneous tubercles on proximal third and a single somewhat more acute corneous one at base of distal third; distal two-thirds with a broad band of minute denticles. Armature of both fingers flanked above and below by dense plumose setae. Lateral surface of immovable finger with a row of punctations bearing short heavy hairs.

Carpus of first pereopod longer than broad with a very shallow longitudinal furrow on upper surface, setae present on all surfaces; punctate except on mesial portion of upper surface where there are scattered squamous tubercles. Mesial surface with a prominent median spine and a much smaller one lying immediately distad of it; another prominent spine just proximad of upper mesiodistal angle. Lower surface with two large spines on distal border.

Merus with two large spines near upper distal margin; a prominent spine on lower lateral extremity. Lower surface with the usual lateral row reduced to two tubercles of which the proximal one is very small and the distal one prominent; inner row consisting of eight tubercles, the distal one considerably larger than the others. Otherwise the entire podomere bears scattered setiferous punctations.

Hooks on ischiopodites of third pereopods only; hooks strong with proximal surfaces subplane and bearing setae.

Coxopodites of fourth and fifth pereopods without projections.

First pleopod almost reaching coxopodite of second pereopod when abdomen is flexed. Tip terminating in two distinct parts which are separated for only a short distance and subequal in length. Central projection corneous, cephalic surface almost straight except at extreme tip where it is recurved; caudal surface sloping cephalodistad except at extreme tip where it follows contour of cephalic surface. Mesial process non-corneous except at tip, and directed caudodistad and slightly laterad.

Morphotypic Male, Form II.—Differs from the holotype in only a few minor respects: Antennae extend caudad almost to telson; opposable margin of immovable finger with only four rounded corneous tubercles on proximal third; longitudinal ridges on fingers not nearly so well defined; spines on rostrum stronger, and acumen extends cephalad to distal end of peduncle of antennule; inner row of spines on lower surface of merus only five in number, while the two in outer row are about the same size. First pleopod with no corneous parts, nor are the two processes so acute distally; otherwise very similar (see figs. 3 and 5).

Allotypic Female.—Differs from the holotype in the following respects: Antennae extend caudad to fourth abdominal segment; rostrum slightly narrower at base than immediately distad of it; no longitudinal ridge on epistome; lower surface of merus with outer row of three large spines and inner row of seven, only the most distal of which is large; chela, except for proportion (see measurements) similar and with almost identical tubercle arrangement. Annulus ventralis subovate with the greatest length in the transverse axis, immovable. Sinus originates to the left of midventral line near midlength, runs caudodextrad and slightly crosses the midventral line where it turns very gently caudodextrad, and almost reaches the midcaudal margin of the annulus (see fig. 1).

Measurements.—Holotypic Male: carapace, height 10.9 width 12.2, length 26.0 mm.; areola, width 1.4, length 8.3 mm.; rostrum, width 4.3, length 7.0 mm.; abdomen, broken; right chela, length of inner margin of palm 7.2, width of palm 7.9, length of outer margin of hand 19.9, length of dactyl 11.1 mm. Allotypic Female: carapace, height 10.9, width 12.5, length 26.2 mm.; areola, width 1.4, length 8.1 mm.; rostrum, width 4.2, length 8.3 mm.; abdomen, length 27.6 mm.; right chela, length of inner margin of palm 5.3, width of palm 6.1, length of outer margin of hand 14.6, length of dactyl 7.8 mm.

Type Locality.—Robinson Creek, State Highway 57, Hardin County, Tennessee. "The bottom of the creek was of red clay and gravel with a few rocks forming riffles. The flow was relatively slow and large pools of relatively quiet waters were formed. The pools had large amounts of clay along the shore in the deeper areas, becoming quite

soft and mucky in such regions. The water was about one foot deep at the gravel bars, deepening to as much as 5 or 6 feet in a few of the pools. The stream was 10 to 15 feet wide, heavily shaded, and had some water-side vegetation. Exposed gravel bars were occasionally found along the bank, at which damselflies congregated in considerable numbers." (Wright 1946:279).

Disposition of Types.—The holotypic male, form I (U.S.N.M. no. 85144), the allotypic female and morphotypic male, form II (U.S.N.M. no. 85145), are deposited in the United States National Museum. Of the paratypes, a second form male and a female are deposited in the University of Michigan Museum of Zoology, and four males, form II, one female, and one immature female are in my personal collection at the University of Virginia.

Specimens Examined.—Tennessee, Hardin County: Robinson Creek, St. Hy. 57 (June 2, 1945, 1 ♂, form II), (September 8, 1945, 1 ♂, form I, 1 ♀ immature); Creek one mile south of Counce (September 8, 1945, 5 ♂ ♂, form II, 3 ♀ ♀). All specimens collected by Dr. Mike Wright.

Relationships.—*Orconectes wrighti* has its closest affinities with the members of the *Limosus* Section, and seems to have more in common with *Orconectes indianensis* (Hay 1896:494) than any other single species.

Key to the Epigeal Species of the *Limosus* Section
(Based on the First Form Male)

- | | | |
|--------|---|--|
| 1 | First pleopod with central projection and mesial process directed caudadistad | 2 |
| 1' | First pleopod with central projection and mesial process never both directed caudadistal | 4 |
| 2 (1) | Central projection bent caudad at an angle greater than 45° | <i>O. harrisoni</i> (Faxon 1884:130) |
| 2' | Central projection directed caudadistad at less than an angle of 45° | 3 |
| 3 (2') | Central projection recurved throughout its length; no median carina on rostrum | <i>O. kentuckiensis</i> Rhoades (1944:122) |
| 3' | Central projection recurved but no throughout its entire length; median carina present on rostrum | <i>O. sloani</i> (Bundy 1876:24) |
| 4 (1') | Mesial process and central projection subparallel and directed distad | 5 |
| 4' | Mesial process directed caudadistad and central projection directed distad or cephalodistad | 6 |
| 5 (4) | Terminal elements of first pleopod subequal in length or mesial process slightly longer than central projection | <i>O. tricuspis</i> Rhoades (1944:117) |
| 5' | Mesial process never extending quite so far distad as central projection | <i>O. rafinesquei</i> Rhoades (1944:116) |
| 6 (4') | Lateral surface of carapace with more than one spine | <i>O. limosus</i> (Rafinesque 1817:42) |
| 6' | Lateral surface of carapace with only one spine | 7 |
| 7 (6') | Margins of rostrum decidedly thickened, and concave laterad | <i>O. shoupi</i> Hobbs (1948:14) |
| 7' | Margins of rostrum not conspicuously thickened, and subparallel or convergent | 8 |

- 8 (7') Upper surface of rostrum hirsute; fingers of chelae not gaping
----- *O. wrighti* Hobbs (*supra*)
- 8' Upper surface of rostrum with scattered setiferous punctations;
fingers of chelae slightly gaping ----- *O. indianensis* (Hay 1896:
494)

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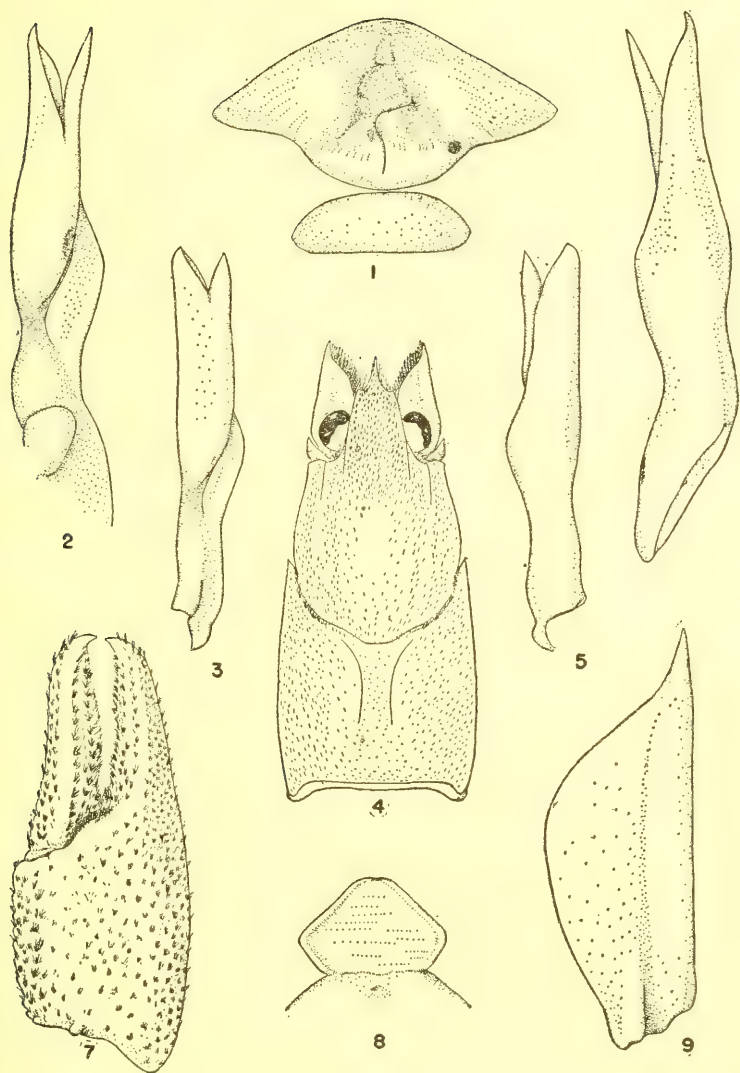
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EXPLANATION OF PLATE

Orconectes wrighti, sp. nov.

Pubescence removed from all figures except 4 and 7.

- Fig. 1. Annulus ventralis.
- Fig. 2. Mesial view of first pleopod of first form male.
- Fig. 3. Mesial view of first pleopod of second form male.
- Fig. 4. Dorsal view of carapace.
- Fig. 5. Lateral view of first pleopod of second form male.
- Fig. 6. Lateral view of first pleopod of first form male.
- Fig. 7. Upper surface of chela of male.
- Fig. 8. Epistome.
- Fig. 9. Antennal scale.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW GENERA OF XYSTODESMID MILLIPEDS
FROM EASTERN UNITED STATES

BY RICHARD L. HOFFMAN¹

*Miller School of Biology
University of Virginia*

Of the two new generic names proposed in this paper, one is based on a species originally described in the genus *Apheloria*. The other is based on specimens in the collection of the United States National Museum.

In 1942 (Ent. News, 53:169-70), Mrs. Nell Causey described a new species of xystodesmid milliped under the name *Apheloria bidens*. The type locality was said to be in the Great Smoky Mountains National Park, near Chimneys, Sevier County, Tennessee; and the male holotype was deposited in the collection of the Academy of Natural Sciences of Philadelphia, No. 11263.²

In connection with a monographic study of *Apheloria* (now in preparation) I have examined thus far a large number of specimens belonging to 11 of the 18 species now included in that genus. From the information at hand, it seems that *Apheloria* may be divided into three sections on the basis of the distal joint of the male gonopod. One section includes only the disjunct *A. ainsliei* Chamberlin, which is characterized by the large serrate mesiobasal process. A second group contains species in which the tip of the telopodite blade is bent laterad, and the basal spine is borne on an oblique cephalic ridge. The third group is composed of species in which the telopodite blade is bent mesiad and the basal spine is borne on a small lateral shoulder. These three groups will be defined in greater detail in the forthcoming generic revision.

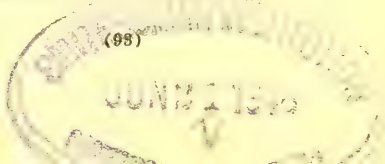
Regardless of the direction in which the blade is directed, or the location of the basal spine, the former is always entire and the latter always present in one of the two positions. The gonopod of *A. bidens* does not conform in either particular, and it seems advisable to establish a separate genus for its inclusion.

Falloria, new genus

Diagnosis.—Related to the established xystodesmid genus *Deltotaria* in the conspicuously upward production of the cephalolateral portion of the base of the telopodite, and in lacking a small curved basal spine. From *Deltotaria* it differs in the bifid nature of the tip of the telopodite blade as well as in that structure being somewhat compressed instead of being subcylindrical in cross-section.

¹I wish to express my gratitude to Mr. Lawrence M. Carter for assistance with the drawings, to Dr. Horton H. Hobbs, Jr., for providing facilities for study, and to Mr. H. F. Loomis for graciously permitting me to describe the new form named here as *Anfractogon tenebrans*.

²I am indebted to Dr. James A. G. Rehn for permission to study this specimen on a recent visit to the Academy.



Genotype.—*Apheloria bidens* Causey.

The production of the cephalolateral portion of the base of the telopodite, alluded to in the preceding diagnosis, is not especially evident in the drawing of *Deltotaria brimleii* (Causey, *op. cit.*, fig. 1), but is to be seen in the recently described *D. nigrimontis* Chamberlin and in a species described by the present writer (in press).

Anfractogon, new genus

Diagnosis.—A genus of the Xystodesmidae characterized by processes on the sternites of the third, fourth, and fifth pairs of legs of the male; and by the structure of the male gonopod, the telopodite of which is jointed, in this respect like the established genus *Brachoria* but with the distal end much modified and the basal spine different.

Description.—Large forms, in general with the characters of the family in conformation of the segments, legs, antennae, etc. The sternites between the third pair of legs in the male bear an upright conical process formed by the fusion of two elements which protrude up from the mesoventral part of the segment; the sternites between the fourth and fifth legs of the male each with a pair of small, conical knobs. The gonopods large, the telopodite curved as in *Apheloria*, etc., and with a joint like that of *Brachoria*; the distal end variously modified and branched. Repugnatorial pores dorsal in position, on the keels of segments 5, 7, 9, 10, 12, 13, 15-19. Femora with slightly curved spines.

Genotype:

Anfractogon tenebrans, new species

(Figs. 1-3)

Diagnosis.—With the characters of the genus, further distinguished by the terminal modifications of the male gonopod, as represented in the accompanying illustrations.

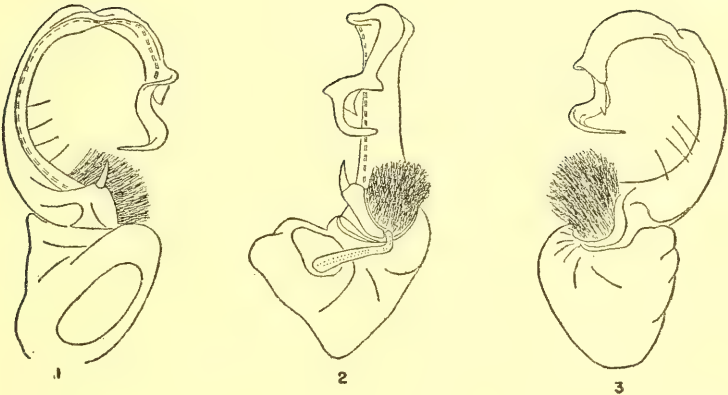
Description.—A large species, length of holotype, 43, width, 11.9 mm. Width of body averages 26% of length approximately. Body robust, gently tapering cephalad, more abruptly caudad. Segments four through fourteen of full width.

Collum small, ellipsoid in shape, with small anterior and lateral marginal ridges; conspicuously emarginate across caudal edge. Front and back edges about evenly tapered laterad, lateral extremities directed slightly caudad.

Second and third segments with cephalolateral edges swept back, dorsolateral marginal ridges small. Segments four through fourteen subsimilar, anterior corners rounded, slightly lobed cephalad, posterior corners directed slightly caudad but not exceeding tergite at midline; segments fifteen through nineteen with keels becoming increasingly produced caudally; keels of nineteenth equal in length to exposed portion of tergite at midline. All tergites well arched, slightly wrinkled under low magnification; keels broad, directed downward. Repugnatorial pores dorsal in position, in the usual elongate swelling.

EXPLANATION OF PLATE

Fig. 1. *Anfractogon tenebrans*, n. sp., left gonopod of male holotype, lateral view; Fig. 2, the same, cephalic view; Fig. 3, the same, mesial view.



Anal segment triangular in dorsal aspect, longer than broad, basal width slightly greater than distance between keels of nineteenth segment. Anal valves slightly inflated, glabrous, smooth, with a small tubercle near the center of each. Preanal scale subtriangular with large lateral terminal lobes.

Bases of last pair of legs almost in contact. Legs of segments eight through eighteen subsimilar; sternites of posterior pair on each segment with small pointed lobes, coxae and trochanti unarmed, femora with long slightly curved spines, terminal tarsal joint equal to other two in length, slightly shorter than femur, with slender curved claw.

Coxae of second pair of legs with cylindrical, distally truncate, seminal processes; sternites between third pair of legs with a large conical projection (formed by the fusion of two extensions of the mesoventral portion of the segment); those between the fourth and fifth legs each with a pair of small pointed tubercles. Pregenital limbs much more hairy than postgenital legs.

Gonopods in place lie with their median axes at right angles to the median axis of the body, the terminal elements crossed. Base of telopodite with the following structures: a large, flattened, cephalolateral shoulder bearing a short heavy upright spine; a rounded mesial setiferous knob, behind which is a chitinous ridge; and a mesial sinus caudad of the ridge. At midlength the telopodite blade is articulated, the distal half becoming flattened, bent, and bearing the following elements: (1) a small rudiment of a mesial branch, (2) a very thin chitinous lamella, and (3) a large flat terminal branch which is bent mesiad and then caudad, becoming drawn out into a fine tip. There is a seminal groove which commences at the cephalic base of the setiferous knob and runs caudad between it and the lateral shoulder, thence along the lateral edge of the blade almost to the tip of the terminal branch. For further details of the gonopods consult the accompanying drawings.

Color in life not known, but appears to have been black with the entire keels yellow or red. Certain tergites of the much faded type suggest that it may have had a median row of spots.

Type specimens.—Male holotype and male paratype in the U. S. National Museum, No. 1811. These specimens were collected at an undesignated locality in Winston County, Alabama, by Dr. Lucien M. Underwood in June 1896.

Remarks.—These diplopods had been examined by Dr. O. F. Cook and labeled *Fontaria tenebrans*. Mr. Loomis, who had borrowed them with other material from the National Museum, also recognized them as an undescribed species and as representing a new genus as well. On learning of my interest in eastern millipeds, Mr. Loomis kindly forwarded the specimens to me with the suggestion that I describe them.

The types are much bleached and seem to have been dried at one time. They are broken into many pieces and the distal halves of the gonopods of the paratype have been broken off. Despite the fragmentary condition of the specimens, I was able to match the pieces satisfactorily.

Judging from the configuration of the male gonopods, the genus *Anfractogon* belongs to the group of xystodesmid genera including *Apheloria*, *Deltotaria*, *Sigiria*, and *Brachoria*. It is most like the latter in the jointed nature of the telopodite.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

AN UNDESCRIBED EASTERN COTTON RAT

BY MARSHALL C. GARDNER

During the course of a revision of the North American cotton rats (Genus *Sigmodon*) the author discovered another hitherto unrecognized subspecies. It is described as follows:

Sigmodon hispidus komareki,¹ subsp. nov.

Type specimen.—Adult ♂, skin and skull, No. 207210, U. S. National Museum (Biological Surveys Collection); collected March, 9, 1915, by L. J. Goldman; original number, 2128.

Type locality.—Woodville, altitude 616 feet, Jackson County, Alabama.

Geographic range.—Not completely known but includes most of the area above the hundred foot altitude line in Alabama, Georgia, North and South Carolina. Specimens have also been examined from one locality in southeastern Tennessee. The most typical specimens examined occurred at the higher altitudes. Carolinian and Austroriparian life zones.

Diagnostic characters.—At once distinguishable from *Sigmodon hispidus hispidus* by the buffy upper parts which are also less mixed with black hairs than typical *hispidus*. Under parts fairly uniformly light colored varying from white to cream in contrast to *hispidus* which varies from white to brown. The feet average considerably paler than in *dispidus*. Cranial characters similar to *dispidus*.

Color.²—*Type*: Upper parts honey sweet (XI I-6) mixed with black, becoming richer posteriorly and paler on the flanks; under parts a shade of cream but color not named (IX C-1); tail bicolor, rose ebony (VIII E-6) above, paler beneath.

Skull.—Similar to that of *hispidus*.

Measurements.—*Type*: Total length, 266; tail vertebrae, 99; hind foot, 31; condyloincisive length, 34.7; length of anterior palatine foramina, 8.0; palatal bridge, 7.7; nasal length, 13.9; zygomatic breadth, 20.0; least interorbital breadth, 5.5; cranial breadth, 14.1; maxillary tooth row, 6.4.

¹Named for Edwin V. Komarek of Thomasville, Georgia, in recognition of his cooperation with the Section of Biological Surveys of the U. S. Fish and Wildlife Service.

²The color names and symbols are those used in *A Dictionary of Color*, by A. Maerz and M. Paul; McGraw-Hill Book Company, Inc., New York, 1930.

STATISTICS ON 31 ADULT MALE SPECIMENS³

Character	Mean	Standard Deviation	Observed Range	Variation Coefficient
Total length _____	265	13.9	248-292	5.27
Tail length _____	104	9.3	89-124	8.90
Body length _____	161	8.1	146-181	5.05
Foot length _____	32	0.4	29-34	1.35
Condylolincisive length ____	33.5	1.2	32.0-35.9	3.56
Anterior palatine foramina length _____	8.1	0.5	7.2-9.1	5.71
Palatal length _____	6.7	0.5	6.1-7.9	5.08
Nasal length _____	13.8	0.7	12.3-15.3	5.37
Zygomatic breadth _____	19.9	0.7	18.6-21.4	3.71
Least interorbital breadth ____	5.1	0.3	4.7-5.8	5.00
Cranial breadth _____	14.0	0.5	13.2-15	3.98
Maxillary tooth row _____	6.2	0.25	5.7-6.6	3.71

Remarks.—Intergradation with *S. h. hispidus* occurs on both sides of the hundred foot line. Specimens from Dean, Alabama, and Elkin, North Carolina are included on geographic grounds but resemble *hispidus*.

Specimens examined.—Total 160, all in the National Museum or Biological Surveys collection, from the following localities.

ALABAMA: *Autauga County*: Autaugaville, 1. *Bibb County*: Sand Mountain, 1. *Clay County*: Dean, 2; Erin, 2. *Conecuh County*: Castleberry, 1. *Cullman County*: Ardell, 2. *Hale County*: Gallion, 4; Greensboro, 6. *Henry County*: Abbeville, 2. *Houston County*: Ashford, 5. *Jackson County*: Woodville, 8. *Lee County*: Auburn, 3. *Madison County*: Huntsville, 1. *Marshall County*: Cane Creek, 1. *Montgomery County*: Barachias, 2. *Russell County*: Seale, 7. *Wilcox County*: Catherine, 1.

GEORGIA: *Berrien County*: Nashville, 1. *Cherokee County*: Canton, 2. *Cobb County*: Marietta, 5; no locality 1. *De Kalb County*: Camp Gordon, 3. *Early County*: Blakely, 2. *Fulton County*: Fort McPherson, 5. *Murray County*: Chatsworth, 2. *Muscogee County*: East Point, 1. *Richmond County*: Augusta, 2. *Spalding County*: Pomona, 2. *Stephens County*: Avalon, 9. *Taylor County*: Butler, 5. *Towns County*: Young Harris, 3.

NORTH CAROLINA: *Anson County*: Wadesboro, 2. *Cherokee County*: Murphy, 5. *Richmond County*: Rockingham, 9. *Surry County*: Elkin, 1. *Wake County*: Raleigh, 33.

SOUTH CAROLINA: *Darlington County*: Society Hill, 6. *Laurens County*: Clinton, 1. *McCormick County*: McCormick, 5. *Newberry County*: Whitmire, 2. *Oconee County*: Walhalla, 2. *Pickens County*: Easley, 1.

TENNESSEE: *Hamilton County*: Rathburn, 1.

U. S. Fish and Wildlife Service, Washington, D. C.

³From localities throughout the range.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW BIRDS FROM THE MISHMI HILLS

S. DILLON RIPLEY

During the course of study of a collection of birds from the Mishmi Hills, northern Lakhimpur District and Sadiya Frontier Tract, Northeastern Assam, I have had occasion to diagnose certain species and subspecies as being heretofore undescribed. The description of these forms follows below. The complete list of the collection, including all species noted from this little-known area of Northeastern India, will be prepared and published jointly in the Journal of the Bombay History Society by my companion on part of this trip, Mr. Salim Ali, and myself.

In the descriptions below, where colors are of critical importance, they are derived from Ridgway (Nomenclature of Colors, 1886).

Streptopelia chinensis edwardi subsp. nov.

Type.—♂ ad. (U.S.N.M. No. 390144), collected December 22, 1946, by Edward C. Migdalski at Chabua, Lakhimpur District, N.E. Assam.

Diagnosis.—from *suratensis* of India this race differs by being conspicuously darker in tone of plumage on the back, rump, upper tail coverts and upper surface of the rectrices. The terminal bars on the feathers of the back and median wing coverts are darker buff in tone and much reduced in extent. There is a tendency towards larger size in this race, nine males and females measuring; wing 141-150.5; tail 139-145; culmen 16.5-19; as against slightly smaller measurements for north Indian birds; wing 135-148; tail 133-142; culmen—up to 16.5. However, Assam specimens of *suratensis* are as large as *edwardi*.

From *tigrina* this race differs by being darker on the back, rump, upper tail coverts and upper surface of the tail. In *tigrina* the rufous terminal bars on the upper surface tend to disappear, merging into the color of the feathers themselves, so as to present the appearance of a pale edging to each feather.

Range.—Lakhimpur District, northeast Assam, both north and south of the Brahmaputra and Lohit Rivers.

Remarks.—Stuart Baker (Fauna Brit. Ind., Birds, V, 1928, p. 243), remarks that Cachar and Manipur birds are intermediate between *suratensis* and *tigrina*. This is not entirely true in the case of these northeastern Assam birds, for they have a fuscous tone on the upperparts which is different from either race. Cachar birds, however, partake of the same basal brownish color as Indian *suratensis* with which I unite them. It gives me great pleasure to name this race after Mr.

JUN 18 1948

JUN 21 1948

Migdalski who accompanied me on the Smithsonian-Yale Expedition, and who spared no pains in pursuit of this species.

The type specimen is in breeding condition and measures; wing 148; tail 146; culmen 17. Soft parts; iris pinkish-purple; feet pinkish-purple.

***Athene brama ultra* subsp. nov.**

Type.—♂ ad. (U.S.N.M. No. 390159), collected Dec. 21, 1946, by S. Dillon Ripley at Chabua, Lakhimpur district, N.E. Assam.

Diagnosis.—This race differs from *indica* by somewhat larger size and darker coloration. On the upper parts, particularly the center of the back, the amount of white spotting characteristic of the species is very considerably reduced. From *brama* this race differs by larger size and reduced spotting on the back.

From *pulchra* this race can be distinguished by larger size, slightly paler coloration, and by reduced spotting on the back. From *mayri* of northern and eastern Siam, *ultra* apparently differs by larger size, slightly paler coloration and by reduced spotting on the back.

Measurements		wing	tail	culmen (from cere)
<i>ultra</i>	2 ♂ ♂ Chabua	164.5, 167	83, 92.5	15, 15.5
<i>indica</i>	6 ♂ ♂ Nepal, C. P.			
	Punjab	152.5-164(158.3)	74-81(76.7)	14(5)
"	13 ♀ ♀ "	154-165.5(160.4)	67-86(78.5)	13-14.5(13.8)

Range.—Lakhimpur district, N.E. Assam, north and south of the Brahmaputra and Lohit Rivers.

Remarks.—Birds collected recently by Walter Koelz in the Central Provinces approach *brama* in size and color. Mayr (Ibis, 1938, p. 313), and Deignan (Bull. 168, U.S.N.M., 1945, p. 181), give measurements of *pulchra* and *mayri*. Wing measurements of *pulchra* run from 138-152 mm., of *mayri* from 152-163 mm.

***Megalaima virens mayri* subsp. nov.**

Type.—♂ ad. (U.S.N.M. No. 390200), collected Jan. 6, 1947, by E. C. Migdalski at Dreyi, Mishmi Hills, N.E. Assam.

Diagnosis.—From *Megalaima virens magnifica* of Assam, this form differs by being very noticeably darker both above and below. It is apparently somewhat larger also, with a greater amount of black on the culmen. From *M.v.clamator* of N. Burma, this race differs by having yellow-tipped nape feathers, and by being somewhat less richly colored on the lower surface. In size it appears to be identical with that race.

Measurements of type.—Wing 147.5, tail 100, culmen 45.

Range.—Mishmi Hills, N.E. Assam.

Remarks.—I should have been reluctant to describe this race from a single specimen which happens to be intermediate in character between *magnifica* and *clamator*. I would have included it in the latter race, which it resembles very closely, had it not been for the fact that this type as well as other specimens noted in the field all have the yellow pointed feathers on the nape, an important and distinctive pattern which *clamator* lacks. This race is named for my friend and preceptor, Ernst Mayr, who first pointed out the differences between the neighboring Assam and Burma populations.

***Pycnonotus striatus arctus* subsp. nov.**

Type.—ad. ♂ (U.S.N.M. No. 390402) collected January 2, 1947, by S. Dillon Ripley at Dreyi, Mishmi Hills, N.E. Assam.

Diagnosis.—From *striatus* this race differs by having darker more pronounced tips to the feathers of the crown as well as darker shading on the webs of the crest feathers. The white shaft streaks on the crown and back tend to be slightly narrower and margined on the back with darker olive green. The blackish shading on the tail is more intense and heavier. Below the blackish shading on the breast feathers is heavier and carried farther down onto the abdomen. In bill size also, sexed birds of this race tend to be larger than *striatus*.

From *paulus* this race differs by larger size and darker coloration.

Measurements		wing	culmen
Type	♂	117.5	19
Mishmi Hills	♂ ♂	110-118	19-21.5
	♀ ♀	109-114	18.5-20
Nepal	♂ ♂	107-114	18-18.5
	♀ ♀	104.5-107	17-17.5
Yunnan (<i>paulus</i>)	♂ ♂	105-110	
	♀ ♀	103-108	

Range.—Northeastern Assam in the Mishmi Hills and the adjacent areas of Northern Burma. *P.s.striatus* occurs in the Himalyas from Nepal to Bhutan, to Cachar in Assam and to the Chin Hills (Mt. Victoria).

***Pomatorhinus montanus salimalii* subsp. nov.**

Type.—ad. ♂ (U.S.N.M. No. 390314) collected Jan. 13, 1947, by S. Dillon Ripley at Tezu, Mishmi Hills, N.E. Assam.

Diagnosis.—From *schisticeps* this race differs by having the slaty cap replaced by deep blackish-slate and the ear coverts are dark rich black rather than the smokey black tone of the former race. The rest of the upper parts are slightly darker.

From *cryptanthus* of Dibrugarh and Margherita this race differs by being darker more blackish on the upper parts and with a distinct blackish cap. In *cryptanthus* the cap is not clearly demarcated from the back and partakes of its brownish tone, although not as rufescent in tone as the back. The wing coverts and the edges of the wing feathers are darker also in *salimalii* than in *cryptanthus*. From *mearsi* this race differs by being darker and smaller.

In size this race seems to be intermediate between *schisticeps* and *cryptanthus*:

		wing	culmen
<i>schisticeps</i>	Nepal, ♂ ♀	95-105(99.2)	28.5-31.5(30.3)
Darjeeling.			
<i>salimalii</i> , Mishmi Hills	♂ ♂	94.5, 97	31, 33
<i>cryptanthus</i> Dibrugarh,	♂ ♀	92-96(93.5)	30.5-34(32.2)
Margherita			

I have examined thirty fresh specimens of this species and would define the ranges of these races as follows:

1. *Pomatorhinus montanus schisticeps*

Range.—Nepal, Sikkim, Buxar Duars, Bhutan Duars, Mikir Hills, Cachar, and across Assam to Tamanthi on the central Chindwin (see Mayr, Ibis, 1938, p. 286. spec. examined).

2. *P. m. cryptanthus*

Range.—North Lakhimpur Division of Assam from Dibrugarh to Margherita.

3. *P. m. salimalii*

Range.—Mishmi Hills.

4. *P. m. mearsi*

Range.—Western Burma on the lower Chindwin (Taungdwin, Wabobin,) Chin Hills and Arakan.

This race is named in honor of Mr. Salim Ali.

***Garrulax moniliger badius* subsp. nov.**

Type: ad. ♂ (U.S.N.M. No. 390319), collected Jan. 11, 1947, by S. Dillon Ripley at Tezu, Mishmi Hills, N. E. Assam.

Diagnosis: From *moniliger* this race differs by being darker, more saturated with rich rufous particularly on the nuchal collar and on the underparts. However, the whole tone of the plumage of these birds is affected by the rufous cast. The white on the ear coverts is much reduced.

Range: Lakhimpur Division of northern Assam in the region of Margherita and across the Lohit River in the Mishmi Hills.

Remarks: Stresemann (Mitt. Zool. Mus. Berlin, 1940, 24, p. 210) mentions that a Margherita specimen taken by Stevens is very rufescent. This is corroborated by the above type, and another male from the Mishmi Hills, and by specimens from Margherita in the American Museum of Natural History collection. Birds from the upper Chindwin particularly, and to a lesser extent from northern Burma, show a cline towards this coloration, but they are really closer to *moniliger*.

Stuart Baker's description of *moniliger* in the "Fauna" (1922, p. 152), when discussing differences between *fuscata* and the typical race, reads as if *moniliger* had a reduced amount of white on the ear coverts. Typical *moniliger* from Nepal, possibly not available to him, has considerable white on the ear coverts, and in fact I do not see that the race *fuscata* is a valid one. The color of the tips of the tail feathers seems to vary from white to buffy-white partly according to the age of the feathers or of the specimens in a collection. It is an uncertain character. However, the reduction of the white area on the ear coverts does occur in Cachar birds (which Baker lumped in *moniliger*), and in *badius*. There is some variation in the amount of white in Cachar birds, however, and so I would not suggest resurrecting *maclellandii* Blyth.

***Garrulax erythrocephalus imprudens* subsp. nov.**

Type: ♀ ad. (Collector's No. 328) collected Jan. 6, 1947 near the Tid-ding Saddle above Dreyi, Mishmi Hills, N. E. Assam by S. Dillon Ripley.

Diagnosis: From *nigritum* of Sikkim and Bhutan (see Kinnear's note, Ibis, 1937, p. 32) this race differs by being darker brown on the upper back and darker olive-brown below with somewhat heavier black subterminal barring on the throat and breast and more fulvous-whitish

bloom on the nape, sides of lower throat and breast. This color fades with age, and in fact foxed specimens of *nigrimentum* tend to assume the reddish-brown tone of *imprudens*. In this race the tail and wings are colored orange-golden rather than yellow-golden as in *nigrimentum*. The lower abdomen is washed with bistre rather than tawny-olive.

Measurements: Wing 101.5, tail 107, culmen 21.5.

Range: Miri, Dafia and Mishmi Hills, N. E. Assam.

Remarks: Birds in the British Museum collection from the Miri and Dafia Hills and a specimen from Nyuksang, lower Brahmaputra, collected by Capt. F. M. Bailey, agree with this single Mishmi specimen. As a result I have decided to name this race on the basis of these several specimens although it has the same basic color pattern as *nigrimentum*, and differs from that race primarily in degree. This race differs from *erythrocephalus* to the west, and from *godwini*, *chrysopterum* and *erythrolaema* to the south as does *nigrimentum*; see Stuart Baker's key (Fauna Brit. Ind. Birds, I, 1922, p. 163).

***Leiothrix argentauris gertrudis* subsp. nov.**

Type: ad. ♂ (U.S.N.M. No. 390393), collected December 25, 1946, by S. Dillon Ripley at Dening, Mishmi Hills, N. E. Assam.

Diagnosis: From *argentauris* this race differs by having more of a yellowish, less of an orange wash on the nape, and by being more olive-greenish on the back, less grayish. On the underparts the throat is less tinted with reddish, and the abdomen and flanks are more olivaceous. From *vernayi* this race differs by larger size. In color it is virtually similar although somewhat more olivaceous on the lower parts.

	Measurements:	wing	tail	culmen
Mishmi Hills	♂ ♂	75, 79	65, 66.5	15 (2)
	♀	74.5	62	14.5
N. Burma	♂ ♂	74.5, 79	69, 70	14, 15
	♀ ♀	71-74.5	64-68	14-15

Range: Assam in the Mishmi Hills and extreme N. Burma in the Myitkina and Laukkaung subdivision.

Remarks: Mayr (Ibis, 1941, p. 98) identifies these N. Burma specimens as *argentauris*, but notes their resemblance to *vernayi* in color. These Mishmi specimens plus fresh *argentauris* from Nepal confirm that these color differences really exist.

It gives me great pleasure to name this race of this delightful bird after one of my friends and companions in the field, Mrs. Sidney Legendre.

***Spelaeornis badeigularis* spec. nov.**

Type: ad. ♀ (U.S.N.M. No. 390355), collected January 5, 1947, by S. Dillon Ripley at Dreyi, Mishmi Hills, N. E. Assam.

Description: Above bistre, each feather with a dark area in the center bordering the shaft approaching clove brown in tone; tail seal-brown. Wing feathers chocolate on the outer, and seal-brown on the inner webs. The throat is chestnut, each feather with a narrow sepia colored center. The breast feathers are bistre with a black terminal and a white subterminal bar. The feathers of the abdomen are more grayish than the breast, the white subterminal bars are enlarged, and the black terminal bars are much reduced. Along the shaft of these breast feathers runs a

narrow white stripe margined on the external side of the web with black.

Measurements: Wing 48; tail 31; culmen 11.5.

Soft parts: Iris brown; bill black; legs brown.

Range: Mishmi Hills, N. E. Assam.

Remarks: From *Spelaornis caudatus* of Darjeeling, Sikkim and Bhutan, this species differs in the darker color of the upperparts and in the color and pattern of the underparts. In *caudatus* the lower surface except for the center of the abdomen is predominantly cinnamon-rufous. In *badeigularis* the chin is white, the throat is dark chestnut with dark striae and the rest of the underparts are bistre or dark olive-gray. It also has shorter tail coverts.

From *Spelaornis longicaudatus* this species differs by having a proportionately shorter tail, a chestnut throat, and a bold pattern of barring on the abdomen and belly and striae on the throat. In general appearance, except for the chestnut throat, *badeigularis* is nearest to *longicaudatus kinneari* from northern Tonkin.

Comparative Measurements:

		wing	tail	wing-tail index	culmen
<i>caudatus</i>	♂	47	32	68%	11.5
	♀ ♀	46.5-49	27-33	57-67%	11-12
<i>badeigularis</i>	♀	48	31	65.6%	11.5
<i>l. kinneari</i>	♂ ♂	50 (2)	39, 43	78, 86%	12.5, 13.5
	♀	52	38	73%	13

Mayr (Ibis, 1941, p. 71) has clearly pointed out the problems in the neighboring species of *Alcippe*. He remarks that within the species *morrosinia* there seems to be a gliding range of proportions between the forms. The same seems to be true for the species *nipalensis*. I therefore, propose:

Alcippe nipalensis commoda subsp. nov.

Type: ♂ ad. (U.S.N.M. No. 390348), collected December 29, 1946 by S. Dillon Ripley at Dening, Mishmi Hills, N. E. Assam.

Description: From *nipalensis* this race differs by being more richly colored on the back, more rufous-brownish rather than olive. The gray crown is darker gray. Below there is more of a buffy wash on the underparts. In proportion it differs by having the tail shorter than the wing. The wing-tail index varies from 89-98%, whereas in *nipalensis* the wing-tail index runs from 98-106%. From *stanfordi*, this race differs by being darker, as the Arakan race is even paler than *nipalensis*.

Measurements: (males and females)	wing	tail	w-t index	culmen
<i>commoda</i>				
Mishmi Hills	57-61	55-59	94- 98%	12-13.5
Margherita	57-60	54-55.5	90- 92%	12 (3)
Cachar	57-60.5	52.5-57	89- 94%	12-13.5
N. Burma	56-60	51-55	90- 96%	12-12.5
<i>nipalensis</i>				
Sikkim	58-60.5	57-60	98-100%	12-13.5
Nepal	57-63	58.5-63.5	99-106%	12-13.5

Range: Assam in Cachar, North Lakhimpur and the Mishmi Hills, Burma in the upper Chindwin and Myitkina areas.

Xiphirhynchus superciliaris intextus subsp. nov.

Type: ♀ ad. (Collector's No. 325), collected Jan. 6, 1947 by S. Dillon Ripley at Dreyi, Mishmi Hills, N. E. Assam.

Diagnosis: From *superciliaris* this race differs by having a darker crown and lighter upperparts, and a paler throat and paler, more tawny-olive underparts. From *forresti* of north Burma and Yunnan, this race differs by having the underparts more richly colored, tawny-olive rather than cinnamon.

Measurements:	wing	tail	culmen
♀ (type), Mishmi Hills	77	84	55
♂, Manipur	81	90	53

Range: Mishmi Hills and Manipur.

Remarks: This race is exactly intermediate in color between *superciliaris* and *forresti*, and I should have hesitated to name it, especially on a single specimen if I had not had an opportunity this summer of looking at the material in the British Museum. This specimen agrees well with the Godwin-Austen skin from Manipur noted as "unusual" by Kinnear (Ibis, 1937, p. 35), showing that there is a population interposed between the Sikkim and Burma populations which exhibits a well-marked discontinuous cline in color characters. It is notable that this species exhibits a reversal of the usual trend from paler color in the more westerly Himalayas to darker color farther east. Specimens of this race should eventually be collected in the intervening Naga Hills.

Actinodura egertoni lewisi subsp. nov.

Type: ♂ ad. (U.S.N.M. No. 390299), collected Jan. 4, 1947 by S. Dillon Ripley at Dreyi, Mishmi Hills, N. E. Assam.

Diagnosis: From *egertoni* this race differs by having pronounced dark edgings on a very gray head, by having more dark gray wash on the neck and by having a darker back and a tendency to broader striping on the tertiaries. Nepal and Sikkim birds lack the distinctive edging to the crown feathers and have a reduced wash of gray on the throat, nape and breast.

From *khassiana* this race differs by being darker and by not having the pronounced barring on the central tail feathers. From *ripponi* it differs by being much darker, more rufous-brownish on the back and more rufous on the tail.

The type measures: Wing 88, tail 110, culmen 16.5.

Range: Mishmi Hills, N. E. Assam.

This race is named in honor of Wilmarth S. Lewis who has graciously encouraged and assisted the author on numerous occasions.

Orthotomus sutorius luteus subsp. nov.

Type: ♂ ad. (U.S.N.M. No. 390559), collected January 10, 1947 by S. Dillon Ripley at Tezu, Mishmi Hills, N. E. Assam.

Diagnosis: This race differs from *patia* by being more rufous on the forehead and darker on the crown and nape. Below *luteus* is washed with rufous-buff, a stronger richer color than in *patia*. In the same way

this race differs from *longicaudatus* although the nape of that race is as dark as in these Mishmi birds. The type measures; wing 45.5, tail 50, culmen 14.

Range; Mishmi Hills and Margherita, north Lakhimpur district, N. E. Assam.

Remarks: Four birds from Margherita in the American Museum Collection agree with my four Mishmi birds in the strong rufous-buff wash on the underparts. They are not quite as dark on the crown and nape, but close enough for me to include them in this race.

***Seicercus xanthoschistos pulla* subsp. nov.**

Type: ♀ ad. (U.S.N.M. No. 390565), collected Dec. 30, 1946 by S. Dillon Ripley at Dening, Mishmi Hills, N. E. Assam.

Diagnosis: from *xanthoschistos* of Nepal and Sikkim this race differs by being darker, slaty on the crown and mantle and somewhat more washed with olive on the flanks. Nepal and Sikkim specimens are paler above, more slaty-gray with a gray coronal streak, while in *pulla* these tones are equally and proportionately darker. The wing and tail feathers are darker in *pulla*, more blackish in tone, but old skins fade badly. There is no appreciable difference in size.

Range: Northern Assam in Cachar, the Khasia Hills, and Lakhimpur, the Chin Hills and northern Burma.

Remarks: The name *jerdoni* was used for Sikkim specimens which are similar to Nepal birds, when fresh examples are compared.

***Aethopyga nipalensis koelzi* subsp. nov.**

Type: ♂ ad. (U.S.N.M. No. 390621), collected Jan. 7, 1947 by S. Dillon Ripley on the Dening-Dreyi trail, Mishmi Hills, N. E. Assam.

Diagnosis: From *nipalensis* of Nepal this race differs by longer bill. Eleven males and four females of *nipalensis* from Central Nepal measure: wing ♂ 51-58(53.5), ♀ 48.5-50(49.2), culmen ♂ 17.5-19(17.9), ♀ 16.5-18; while six males and two females from the Mishmi Hills measure: wing ♂ 54.5-57(55.8), ♀ 50, 52, culmen ♂ 22-24(22.5) ♀ 20, 21. In color there is no distinctive difference, consequently this race differs from *victoriae* as does *nipalensis*.

Range: Sikkim, Bhutan, Mishmi Hills, northern Burma and Yunnan.

Remarks: Sikkim birds have somewhat shorter culmens approaching *nipalensis* in a cline, but I have not examined any males with a culmen measurement shorter than 21, so feel it best to include them in *koelzi*. This race is named for Dr. Walter Koelz who has been making such splendid collections of Indian birds.

***Passer montanus hepaticus* subsp. nov.**

Type: ♂ ad. (U.S.N.M. No. 390602), collected Jan. 11, 1947 by S. Dillon Ripley at Tezu, Mishmi Hills, N. E. Assam.

Diagnosis; This race differs from *malaccensis* of India and Malaya by being very much darker on the upper and lower parts. The head is purplish brown in color, almost liver-colored and the back, rump and the borders of the wing feathers are dark rich brown, the wing margins being rather rufous. Below this race has a distinct brownish wash on

the gray of the under parts. Two specimens of the series have an infusion of purplish-brown at the lower margin of the black throat patch. From *tibetanus* this race differs by darker color and smaller size. It is in fact the most saturated of any race of the Tree-Sparrow examined by me.

Measurements:		wing	tail	culmen
5	♂ ♂	68-71	50-54	11, 5-12

Range: Mishmi Hills from 500-2,500 feet altitude and North Lakhimpur (Chabua). Northeast Assam. Stuart Baker (B.B.O.C., *XLV*, 1925, p. 93) records a specimen of *tibetanus* from the Abor Hills, and it is possible that that race occurs in the Mishmis above 10,000 feet.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

GEOGRAPHIC VARIATION IN NEWFOUNDLAND
BIRDS

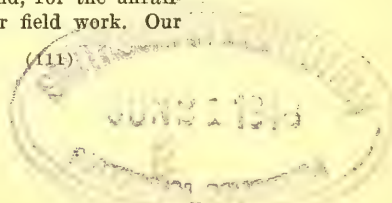
BY THOMAS D. BURLEIGH AND HAROLD S. PETERS

A study of the birds of Newfoundland was undertaken by the authors as a cooperative investigation by the Department of Natural Resources of Newfoundland and the U. S. Fish and Wildlife Service. Field observations were begun by Peters in 1937, but it was not until 1942 that intensive collecting of specimens started. The ultimate objective is to be a comprehensive book on the birds of the country and this technical report is for the purpose of clearing up some of the nomenclatural difficulties and thus prepare the way for the book which is to be written in a more popular style.

Each year since 1942 from 4 to 6 weeks were spent in Newfoundland, the month selected depending upon the immediate objective. The preliminary field work was carried on during the late spring and early summer, the breeding birds being considered of primary importance. In 1944, and again in 1946, the fall migration was given consideration, and in 1947 the winter bird life and the spring migration were the objectives of special field trips. Throughout this field work specimens were taken daily of the various species encountered, and gradually a collection was built up that contained representative series of the characteristic birds of the country. At the conclusion of our study, approximately 2,000 specimens were available for examination, and the notes that follow summarize the information obtained from a critical comparison of this material with specimens in the U. S. National Museum and that borrowed from other museums in the United States and Canada.

We wish to express our appreciation to Dr. Alexander Wetmore, Secretary of the Smithsonian Institution, and to Dr. John W. Aldrich, of the Fish and Wildlife Service, for their assistance in determining the validity of the new races described herein. For the loan of specimens for comparison, we are indebted to the Cleveland Museum of Natural History, the Carnegie Museum, the Museum of Comparative Zoology, the Charleston Museum, the Royal Ontario Museum of Zoology, and Cornell University. The fine series of Ontario specimens in the Royal Ontario Museum proved especially valuable for comparison with our Newfoundland material, and we wish to acknowledge our thanks to Mr. L. L. Snyder, Assistant Director of the Museum, for placing his collections at our disposal. Finally, we wish to express our appreciation to the Department of Natural Resources, at St. Johns, Newfoundland, for the unfailing cooperation received throughout the course of our field work. Our

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special thanks are due Harry W. Walters, Chief Game Warden of the Department, without whose help our activities would have been seriously handicapped. It was through his efforts that we were able to cover the country as thoroughly as we did, and establish the contacts that were of such material benefit.

Newfoundland covers a relatively small area, roughly comparable in size to the state of Virginia and, as one might surmise from its geographical position, has a relatively small number of species indigenous to the country. The total list, based on our observations and those of others who have recorded the results of their field work, comprises about 180 species. Possibly 30 of these are merely of casual or accidental occurrence. From the standpoint of individuals, however, the story is quite different. With few exceptions, whether the species is resident or is present only during the summer months, the characteristic bird life of Newfoundland is, for the most part, plentiful and of general distribution. In the case of a few species, such as the song sparrow and the bronzed grackle, it is probable that only in recent years have they come into the country from the adjacent mainland of Canada, for at present they are confined to the extreme southwestern corner of the country. On the other hand, the robin, the black-poll warbler, and fox sparrow, to mention but a few, occur wherever there is a suitable habitat, and can be found practically everywhere.

Isolation has been considered an important factor in modifying, locally, the genetic characters of a species that occurs over a wide range. The bird life of Newfoundland might well serve as an outstanding example of this phenomenon. Despite the limited fauna, 12 sub-species have previously been described by other workers, and a critical examination of the material now on hand reveals the fact that 8 additional races are worthy of recognition and naming.

Newfoundland birds like those in Labrador show a definite tendency to be noticeably darker than individuals of the same species from the interior of the North American mainland, and although other differences are apparent in some species, this one characteristic is most frequent. One can only theorize as to the reasons for the prevalence of this type of variation, but the unusual climatic conditions which are characteristic of Newfoundland suggest an underlying cause.

Strong winds, which accompany the frequent rains of the spring and early summer months, force the birds to remain much of the time in the shelter of the dark spruce thickets. For this reason, and because of the cloudy weather, the birds of this British colony certainly receive far less sunlight than individuals of the same species occurring elsewhere in eastern North America; and while there may be other contributing factors, the climate of Newfoundland would seem to be the most obvious element which may be correlated with the tendency toward darkened plumage. In the case of a few species, the dark coloration persists in the populations occurring on the southeastern coast of Labrador and more rarely Nova Scotia.

No attempt will be made at this time to discuss in any detail all of the bird life of Newfoundland; comment being reserved for those species of particular taxonomic interest. Material now available makes possible a much sounder opinion as to the validity of certain races heretofore of rather questionable status, and to describe other races possessing charac-

ters that set them apart as distinct subspecies. The criterion used in determining whether the subspecies was of sufficiently doubtful status to be discussed further was whether or not it had been accepted by the committee on classification and nomenclature of the American Ornithologists Union. Absence of the subspecies from the 14th edition of the A.O.U. Checklist and the subsequent supplements published in *The Auk* is considered sufficient reason for discussion here.

Zenaidura macroura (Linnaeus). Mourning Dove.

The present known status of the mourning dove in Newfoundland is that of a casual transient in the fall and early winter months, but the increasing number of records in recent years indicates the possibility that this species may breed, at least sparingly, in the interior. This assumption is further emphasized by the appearance of 7 specimens given to us by James Ewing and W. Templeman of St. Johns, E. J. Bragg, of Port aux Basques, and by the Rev. A. L. Parish, of Rose Blanche. These were a female (locality unknown) taken in 1929; a male and an unsexed specimen from St. Johns, taken in December 1945 and January 1947; 2 specimens, sex undetermined, taken at Port aux Basques on October 5, 1946, and at Red Island on December 2, 1946; a male taken at Rose Blanche on October 22, 1946; and an unsexed specimen taken at Badger, December 5, 1944. All agree in being smaller and noticeably darker, both above and below, than typical *carolinensis*, and with a bill perceptibly shorter and less stout in appearance. It is not improbable that they represent a distinct race, but until their breeding range is determined, it would be impracticable to give them a name. At present, the interior of Newfoundland is difficult of access and relatively little known, so there is no obvious reason why this dove could not nest there undetected over a period of years.

Megasceryle alcyon alcyon (Linnaeus). Eastern Belted Kingfisher.

The kingfisher was a fairly common summer resident in Newfoundland, but so wary that we succeeded in securing but 3 specimens. All were males, and were taken at Glenwood on June 18, 1942, and at Doyles on September 2, 1944, and September 7, 1946. When compared with a small series of typical *alcyon*, they proved to be indistinguishable from the nominate race, although it had been suggested (Noble, 1919) that Newfoundland birds would be found to be distinct from those breeding farther south.

Colaptes auratus luteus Bangs. Northern Flicker.

Our series of flickers, totaling 9 specimens, proved to be indistinguishable from typical *luteus*, this agreeing with the conclusions previously reached by Aldrich and Nutt (1939). The range of *C. a. borealis*, as given by Ridgway (1911:31) includes Labrador and it might be assumed that in common with other Labrador forms this would be the race in Newfoundland. This not being the case, the flicker might have reached Newfoundland by crossing the stretch of open water separating the southwestern corner of the country from Nova Scotia. Under such circumstances, *luteus* would be the race more likely to occur in Newfoundland.

Sphyrapicus varius varius (Linnaeus). Yellow-bellied Sapsucker.

In view of the diversity of opinion concerning the recognition of 2 eastern races of the yellow-bellied sapsucker, we were interested in com-

paring the small series of breeding birds taken in Newfoundland with similar material from the southern Appalachian Mountains. Oberholser (1938) on the basis of measurements alone, recognized 2 races—*varius*, breeding from Pennsylvania south to northern Georgia, and *atrothorax*, breeding from central Mackenzie, southern Quebec, and Newfoundland, south to central Missouri and New York. Of especial interest to us was the fact that the type of *atrothorax*, described by Lesson in 1831, and now in the Paris Museum, came from Newfoundland. A comparison of measurements, however, convinces us that individual variation is so great as to make it impracticable to recognize 2 races on this basis alone, and that *atrothorax* cannot be accepted as a valid form. It is true that an occasional specimen from Newfoundland has a longer wing measurement than any specimen of the same sex taken at approximately the same time in the southern part of the breeding range of this species in the east. On the other hand, a breeding female from Newfoundland, taken at Badger on June 11, 1942, is identical in size with a breeding female collected June 2, 1930, at an altitude of 4,600 feet on Mt. Mitchell, in western North Carolina. Obviously, it would be extremely difficult, if not impossible, to identify specimens taken during the winter months as definitely *varius* or *atrothorax*, so it seems advisable to recognize but one race of *Sphyrapicus varius* in the east.

Dendrocopos pubescens medianus (Swainson).

Northern Downy Woodpecker.

The downy woodpeckers of Newfoundland were separated by Oberholser (1914) as a distinct race which he named *microleucus*. We have compared a series of specimens from various parts of that country with a comparable series of *medianus* from the United States, and have come to the conclusion that *microleucus* is a very weak race that is not worthy of recognition by name. The color of the underparts can be matched by specimens taken as far south as Maryland, and the spotting on the wings is equally variable. There is no appreciable difference in size, and the tendency for the black of the upperparts to be more intense is noticeable only in the most recently taken skins. Accordingly, we think that *microleucus* should be placed in the synonymy of *medianus*.

Perisoreus canadensis sandfordi Oberholser. Newfoundland Canada Jay.

This is another race, the validity of which has been subject to a diversity of opinion among taxonomists. Our series of 30 specimens taken at various times of the year, and in different parts of the country, has been critically compared with equivalent plumaged specimens of both typical *canadensis* from southeastern Canada and of *nigricapillus* from northern Labrador, and we find that the characters, as given by Oberholser (1914) readily separate *sandfordi* from these two forms. From *canadensis*, it differs in being darker below and in having the forehead a duller white. From *nigricapillus* it is distinguishable by being browner, less gray above, which character is common to many of the distinct forms occurring in Newfoundland.

Cyanocitta cristata bromia Oberholser. Northern Blue Jay.

We found the blue jay a fairly common bird in the Humber River Valley, but elsewhere in the country rather local in its distribution, and

far from plentiful. Although Noble (1938) suspected that the blue jays of Newfoundland might prove to be racially distinct, our series of 20 specimens, taken throughout the year, proved not to differ from comparable specimens of *bromia* from the eastern United States, with respect to either size or coloration.

Parus hudsonicus rabbittsi*, new subspecies

Newfoundland Brown-capped Chickadee

Characters.—Similar to *Parus hudsonicus hudsonicus*, of interior Canada, but upperparts, both pileum and back, decidedly paler; flanks lighter cinnamon-brown. Also, noticeably paler than *Parus hudsonicus littoralis* of southeastern Canada. In size, intermediate between these two races, the wing and tail in *rabbittsi* being shorter than in *hudsonicus* and longer than in *littoralis*. The bill is shorter than in either of these forms.

Measurements.—Average of 10 males from various localities in Newfoundland: Wing, 64.3 mm; tail, 59.2; exposed culmen, 6.8. Average of 4 females from various localities in Newfoundland: Wing, 62.7 mm; tail, 58.5; exposed culmen, 7.

Type.—Adult male, No. 394176, United States National Museum, Fish and Wildlife Service collection; St. Andrews, Newfoundland, May 1, 1947; Thomas D. Burleigh, original number 10262.

Distribution.—Newfoundland.

Specimens of Parus hudsonicus rabbittsi examined.—Total number 35, from the following localities in Newfoundland: St. Andrews, 3; Tomkins, 8; Stephenville Crossing 3; Stephenville, 1; Port au Port, 1; Corner Brook, 1; Humbermouth, 1; South Brook, 2; Badger, 5; Grand Falls, 1; Princeton, 1; Bay Bulls, 1; St. Johns, 1; Topsail, 1; N. E. Brook, Canada Bay, 1; Maiden Arm, Hare Bay, 1; La Scie, 1; Bull Island, Trinity Bay, 1; Cow Head, 1.

Remarks.—*P. h. rabbittsi* is the palest of the now recognized races of *Parus hudsonicus*, and is therefore an exception to the general tendency to be perceptibly darker than individuals on the adjacent mainland. This new race appears to be confined to Newfoundland, specimens in comparable plumage examined from New Brunswick, Nova Scotia, and the coast of Labrador being found to be typical of *littoralis*. No decrease in numbers was noted during the winter months, so this species can be considered resident and of general distribution throughout all of Newfoundland.

Table of Comparative Measurements of the Known Races of

	<i>Parus hudsonicus</i>				
	<i>hudsonicus</i> ¹	<i>columbianus</i> ¹	<i>cascadensis</i> ²	<i>littoralis</i> ³	<i>rabbittsi</i> ⁴
Wing	66.2	66	67.6	62	64.3
Tail	64.1	64	65.1	58.4	59.2
Exposed Culmen	9.0	9.1	10.0	7.1	6.8

¹Ridgway, Birds of Middle and North America, Vol. 3, 1904.

²Miller, A. H., Occas. Papers, Mus. Zool., La. State Univ., 14:261-3.

³Five males from Nova Scotia, New Brunswick and Labrador.

⁴Ten males from Newfoundland.

*Named in honor of Mr. Gower Rabbitts, of the Department of Natural Resources, whose interest in the bird life of the country was responsible for the addition of a number of rare species to the avifauna of Newfoundland, and at whose suggestion this detailed study was undertaken.

Certhia familiaris anticostiensis Braund and McCullagh.
Anticosti Brown Creeper.

The brown creeper apparently breeds commonly in the interior of Newfoundland, for while we recorded it on but very few occasions during our summer field work, it proved to be a plentiful fall transient in the southwestern corner of the country. Our series of 27 specimens, including a breeding male taken July 24, 1945, on the Grey River, approximately 9 miles inland from the south coast, possessed characters obviously different from typical *americana*. Comparison with 2 specimens (including the type) of *anticostiensis* borrowed from the Cleveland Museum of Natural History showed that the Newfoundland birds belong to this recently described race (Braund and McCullagh, 1940). Superficially, *anticostiensis* suggests *nigrescens* of the southern Appalachians, but it is less gray (slightly more rufescent) above, has a lighter rump and a darker brown nape. This last character separates it at once from the other eastern races of *Certhia familiaris*. In fresh plumage, the underparts are noticeably whiter, but unfortunately this character is soon lost and, unless the specimen is washed, is rarely distinguishable by mid-winter.

Troglodytes troglodytes aquilonaris, new subspecies
Newfoundland Winter Wren

Characters.—Similar to *Troglodytes troglodytes hiemalis*, but darker and less rufescent above, the underparts paler brown, with the vermiculation of the abdomen and flanks heavier and more extensive. In these characters, it suggests *Troglodytes troglodytes pullus*, but differs from this southern Appalachian race in being paler above, the rufescence of the back having a definitely grayish tinge. There is no appreciable size difference.

Measurements.—Average of 8 males: Wing, 48.1 mm; tail, 30.5; exposed culmen, 10.7. Average of 8 females: Wing, 45.5; tail, 28.3; exposed culmen, 10.5.

Type.—Adult male, No. 394151, United States National Museum, Fish and Wildlife Service collection; Tompkins, Newfoundland; May 14, 1947; Thomas D. Burleigh, original number 10304.

Distribution.—As far as now known, confined to Newfoundland.

Specimens of Troglodytes troglodytes aquilonaris examined.—Total number 23, from the following localities in Newfoundland: Tompkins, 13; Stephenville, 4; Port au Port, 1; Cape St. George, 1; Deer Harbour, Random Island, 1; Round Head Island, St. John Bay, 1; Brigus, Avalon peninsula, 1; Topsail, Avalon peninsula, 1.

Remarks.—This new race is so similar in appearance to the Winter Wren of the southern Appalachians that comparable series of both forms are necessary to identify satisfactorily specimens taken as transients or wintering individuals away from the breeding range of *hiemalis*. The one constant character, the grayish tinge of the upperparts, is admittedly a minor one, but in reexamining a number of specimens of *Troglodytes troglodytes* taken during the winter months in the southeastern United States, and originally identified as *pullus*, no difficulty was experienced in recognizing an occasional specimen of *aquilonaris*. Despite the fact that Newfoundland birds so closely resemble these from the southern

Appalachians, they are widely separated by another race, *hiemalis*, differing much more markedly in appearance.

Turdus migratorius nigrideus Aldrich and Nutt. Black-backed Robin.

This is an exceptionally well-marked race in adult plumage, but where subadult individuals are concerned, *nigrideus* can easily be confused with typical *migratorius*. On examining a small series of breeding birds in fresh, unworn plumage taken in the Codroy Valley in early May, we found that the one character distinguishing one-year-old birds (both male and female) was the deeper red of the underparts. The upper parts lacked entirely the black pattern characteristic of more mature individuals, and the white throat was emphasized by narrow streaks of black, in contrast to the broad and more numerous black streaks found in more mature specimens of *nigrideus*. Aldrich and Nutt (1939) considered this race less highly developed in the western part of Newfoundland but we could distinguish no difference between breeding birds from the Avalon peninsula, the interior, or from the lower Codroy Valley.

***Hylocichla guttata crymophila*, new subspecies**

Newfoundland Hermit Thrush

Characters.—Similar to *Hylocichla guttata faxoni* of the northeastern United States, but entire upper parts from pileum to rump noticeably darker, the flanks grayer and with little suggestion of brown. No appreciable difference in size.

Measurements.—Average of 6 breeding males: Wing, 93 mm.; tail, 69; exposed culmen, 13. Average of 2 breeding females: Wing, 90 mm.; tail, 66.5; exposed culmen, 12. Average of 4 males in fresh fall plumage: Wing, 94.1 mm.; tail, 68.3; exposed culmen, 12.5. Average of 5 females in fresh fall plumage: Wing, 90.4 mm.; tail, 67.4; exposed culmen, 12.

Type.—Adult male, No. 382061, United States National Museum, Fish and Wildlife Service collection; Badger, Newfoundland; June 11, 1942; H. S. Peters and T. D. Burleigh, original number 83.

Distribution.—Newfoundland.

Specimens of Hylocichla guttata crymophila examined. Total number 23, from the following localities in Newfoundland: Tompkins, 3; Sears-ton, 1; Stephenville Crossing, 6; Stephenville, 1; Port au Port, 1; Badger, 1; Princeton, 1; Glenwood, 1; LaScie, 1; St. John Island, 1; St. Genevieve Bay, 1; Heartsease, Trinity Bay, 1; N. E. Arm of Connoire Bay, 1; N. E. Brook, Canada Bay, 1; Maiden Arm, Hare Bay, 1; Grand Beach, Burin peninsula, 1.

Remarks.—This is the darkest of all the known races of the hermit thrush. Birds in breeding plumage can be easily recognized, but it is in fresh fall plumage that the characters of *crymophila* are most evident, the color of the upperparts, at that time, being sepia rather than the isabelline brown of *faxoni*. Young in juvenile plumage are equally distinct, the dark appearance of the upper parts contrasting strongly with the much lighter brown of comparable specimens of *faxoni*. Austin (1932) lists the hermit thrush as a rare summer resident in southern Labrador, but we failed to record this species there during field work carried on in 1943 and 1944, and we have seen no specimens from this region in connection with this study.

***Hylocichla ustulata clarescens*, new subspecies**

Northeastern Olive-backed Thrush

Characters.—Similar to *Hylocichla ustulata swainsoni* of the northeastern United States, but upperparts paler and less olivaceous. In respect to grayishness it approaches *H. u. almae* of continental North America from Labrador westward, but the gray of the back is darker, and there is a definite suggestion of brown.

Measurements.—Average of 7 breeding males from Newfoundland: Wing, 100.8 mm.; tail, 68.7; exposed culmen, 11.5. Average of 5 breeding females from Newfoundland: Wing, 97 mm.; tail, 63; exposed culmen, 11.1.

Type.—Adult male, No. 382037, United States National Museum, Fish and Wildlife Service collection; Glenwood, Newfoundland; June 18, 1942; H. S. Peters and T. D. Burleigh, original number 122.

Distribution.—As far as now known, Newfoundland and Cape Breton Island, Nova Scotia.

*Specimens of *Hylocichla ustulata clarescens* examined*.—Total number 18, from the following localities: Newfoundland: Tompkins, 4; Stephenville, 1; South Brook, 1; Badger, 2; Glenwood, 2; North Arm, Bay of Islands, 1; Norris Point, Bonne Bay, 1; 12 miles up White Bear River, 2; in Nova Scotia: Ingonish, Cape Breton Island, 1; North Ingonish, Cape Breton Island, 3.

Remarks.—Although intermediate in its characters, *clarescens* is distinct from both *swainsoni* and *almae*; it is closer, however, to the latter race. Specimens from Cape Breton Island, Nova Scotia, were found to be similar in every respect to those from Newfoundland, but how extensive the range of this new race is in the Maritime Provinces of Canada has yet to be determined. A breeding male taken June 28, 1943, at the head of Chateau Bay, Labrador, was clearly referable to *almae*, and since Braund and McCullagh (1940) found that specimens from Anticosti Island (in the Gulf of St. Lawrence) were also referable to that race, it would seem that *almae* has an unbroken range across Canada to the Atlantic coast north of the Maritime Provinces.

***Hylocichla minima minima* (Lafresnaye)**

Northern Gray-checked Thrush

In his monograph on the Bicknell's thrush, Wallace (1939) comments on the brownish coloration of some of the gray-checked thrushes of Newfoundland, and suggests the possibility of their racial distinctness from continental forms. With this thought in mind, we collected these thrushes at every opportunity, and succeeded in securing a series of 28 specimens representing the various localities throughout the country where this species was found during the summer months. It was at once apparent, when this series was critically examined, that Wallace was justified in calling attention to this color difference, and also in concluding that a biphasic condition exists on the island. We found that there are two-color phases of the gray-checked thrush in Newfoundland, one olive brown, and the other paler and grayer, both occurring in almost equal numbers. In the series that we had available for study, 16 specimens represented the gray phase, 10 were in the brownish plumage, and 2 were intermediate in their characters. Locality was found to be no factor in limiting the presence or absence of either phase. Two males

taken at Brigus represented both phases; 3 specimens from Glenwood were olive brown, and one was gray. A male from St. Anthony was olive brown, while at Quirpon (north of St. Anthony) one male taken was gray, another somewhat intermediate but approaching the olive brown phase.

In size, the Newfoundland birds with wing length in males, 103-106 mm.; tail, 73-76 mm.; proved to be clearly referable to the large northern race. The correct name for this has been shown by Wallace (1939) to be *minima*.

Mniotilta varia (Linnaeus). Black and White Warbler.

In his publication on the birds of Newfoundland, Noble (1919) commented on the fact that the black and white warblers appeared dark and possibly represented an undescribed race. Our series of breeding birds was compared with a series in equivalent plumage from the eastern United States, and we could find no color difference whereby the Newfoundland birds could be separated as a distinct subspecies. An occasional bird was perceptibly darker, but individual variation was such as to make this character of no value in recognizing a new race. A breeding male taken at Baywood, Louisiana (20 miles north of Baton Rouge), on May 10, 1945, is as dark as the darkest individual collected in Newfoundland. Obviously, it would not be possible to recognize a Newfoundland black and white warbler taken in migration south of its breeding range.

Dendroica striata lurida, new subspecies. Western Black-poll warbler

Characters.—Similar to *Dendroica striata striata* of eastern Canada and Newfoundland, but breeding males less black above, both with respect to the pileum and to the back and scapulars, the pileum a dull black, as compared to the deep, glossy black of typical *striata*. Light areas of back dark gray or pale olive, as compared to the lighter gray, frequently dull white, streaking of the eastern race. Females, and males in fall plumage equally distinct, the upper parts being dull olive green rather than yellow green, and with the black streaks of the back narrower and less distinct. Immatures in first winter plumage distinguished by this same dull olive green plumage. Measurements average very slightly larger than in birds from the eastern part of the range of this species.

Measurements.—Average of 6 breeding males from Alaska: Wing, 75.6 mm.; tail, 51; exposed culmen, 9.1. Average of 6 breeding males from Newfoundland: Wing, 74.2 mm.; tail, 50; exposed culmen, 9.2.

Type.—Adult male, No. 231288, United States National Museum, Fish and Wildlife Service collection; Nushagak, Alaska; June 13, 1911; G. D. Hanna, original number 96.

Distribution.—Northwestern Alaska, northern Mackenzie, northern Manitoba, and northern Quebec (Ungava) south to northern British Columbia and Manitoba. Southern limits still imperfectly known.

Specimens of Dendroica striata lurida examined.—Total number 71, as follows: Alaska, 15; Yukon, 5; British Columbia, 1; Mackenzie, 28; Alberta, 8; Saskatchewan, 10; Quebec (Ungava), 4.

Remarks.—One of the most unexpected results of the critical study of our Newfoundland collections was the fact, immediately apparent, that the Black-poll Warbler was represented by two distinct races, one occupying the eastern portion of its breeding range, the other occurring

in the west. *Dendroica striata* was originally described from Fort Severn, Ontario, and fortunately for us, the collections in the Royal Ontario Museum of Zoology contain an adequate series of breeding specimens from this critical area. The Fort Severn specimens are intermediate in their characters, but closer to the birds from the eastern part of the breeding range of this species. Accordingly, the nominate race must be considered eastern in its distribution, with the western population comprising the above described race, *lurida*. As might be expected, the characters of typical *striata* reach their maximum development in Newfoundland, breeding males being intensely black and strikingly different from breeding males from Alaska. Specimens from Churchill, Manitoba, prove to be intermediate in their characters, but, unlike those from Fort Severn, are closer to the new race.

***Seiurus noveboracensis uliginosus*, new subspecies**
Newfoundland Northern Water-thrush

Characters.—Similar to *Seiurus noveboracensis noveboracensis* of the northeastern United States, but upperparts lighter and more olivaceous; yellow of underparts more intense; streaks on chest and flanks darker and more extensive; wing and tail longer, bill smaller.

Measurements.—Average of 20 breeding males representing all sections of Newfoundland: Wing, 78.3 mm. (extremes, 76-80); tail, 54 (extremes, 52-57); exposed culmen, 10.8 (extremes, 10-12). Average of 8 breeding females from various parts of the country: Wing, 74 mm. (extremes, 68-78); tail, 51.6 (extremes, 52-57); exposed culmen, 10.8 (extremes, 10-11.4).

Type.—Adult male, No. 381382, United States National Museum, Fish and Wildlife Service collection; Topsail, Avalon peninsula, Newfoundland; June 22, 1945; H. S. Peters and T. D. Burleigh, original number 830.

Distribution.—Newfoundland and the adjacent French islands of St. Pierre and Miquelon.

Breeding specimens of Seiurus noveboracensis uliginosus examined.—Total of 35, from the following localities in Newfoundland: St. Andrews, 1; Tompkins, 5; Doyles, 2; St. Georges, 1; Stephenville Crossing, 2; South Brook, 1; Deer Lake, 1; Grand Falls, 1; Gander, 1; Makinsons, Avalon peninsula, 1; St. Johns, 2; Topsail, Avalon peninsula, 1; North Arm, Bay of Islands, 1; Jacksons Arm, 1; St. Genevieve Bay, 1; St. Lunaire Bay, 1; N. E. Brook, Canada Bay, 1; Ariege Bay, Hare Bay, 1; S. W. Arm, Pistolet Bay, 1; St. Anthony, 1; Harbour Deep, 1; Rencontre East, Fortune Bay, 1; Catalina, 1; Heartsease, Trinity Bay, 1; Bull Island, Head of Trinity Bay, 1; Pushthrough, 1; 9 miles up Gray River, 1; Stag Harbour, Fogo Island, 1; from the French Islands of St. Pierre and Miquelon, St. Pierre, 1.

Remarks.—Birds in fresh fall plumage are perceptibly darker than breeding birds, but are easily recognizable because of the olivaceous color of the upperparts, and the even more intense yellow of the underparts. Of the 4 races of *Seiurus noveboracensis*, this new subspecies is the most olivaceous above and the yellowest beneath. *S. n. linnaeus*, from British Columbia, is the opposite extreme, being very dark and grayish above, and with very little yellow on the underparts. *S. n. noveboracensis*, and *notabilis* are intermediate between these 2 races,

noveboracensis being closer to *uliginosus* in coloration, and *notabilis* approaching *linnaeus* in its darker upperparts and limited amount of yellow beneath. Specimens examined from Labrador (male, St. Peters Bay, August 7, 1944; one male and one female, Hawkes Bay, August 14, 1944; one male and one female, Cartwright, August 17 and 18, 1944) were found referable to *noveboracensis*, as were also a small series of comparable specimens from Nova Scotia.

TABLE OF COMPARATIVE MEASUREMENTS

	<i>noveboracensis</i> ¹	<i>uliginosus</i> ²
Wing	75.1	78.3
Tail	50.2	54
Exposed culmen	12.1	10.8

¹Five breeding males from West Virginia.

²Twenty breeding males from Newfoundland.

Geothlypis trichas brachidactyla (Swainson). Northern Yellow-throat.

Although found throughout the country, yellow-throats are rather local in their distribution in Newfoundland, and by no means common. As a species, *Geothlypis trichas* is extremely plastic, and seems to respond readily to any change in environment, so we anticipated a new race when our series of 32 Newfoundland specimens was critically examined. This did not prove to be the case, however, for when compared with specimens of typical *brachidactyla* from the northeastern United States and the Maritime Provinces of Canada, no characters could be found that would separate Newfoundland birds from them. It is possible that this species is a recent addition to the avifauna of Newfoundland, and has had insufficient time to evolve a new race in response to its environment.

In connection with this study, we have examined 2 breeding specimens (including the type) of *Geothlypis trichas pelagitis* recently described from Anticosti Island by Braund and McCullagh (1940), and can find no characters whereby this proposed race can be distinguished from *brachidactyla*.

Setophaga ruticilla tricolora (Müller). Northern American Redstart.

When first separated from other American redstarts (Oberholser 1938), the range of *tricolora* was thought to be limited to the western part of the United States and Canada, but recent studies have shown that this race actually is also represented by the more northern population of redstarts, with a distribution extending across the continent from British Columbia to Newfoundland. Our series of redstarts from Newfoundland, taken in various parts of the country, shows the characters of *tricolora* very well, and demonstrates clearly that this is a valid race. Males are readily distinguished from the nominate race, represented by breeding birds of the eastern United States, by their smaller measurements, and by the noticeably smaller orange speculum. Females and subadult males are even more distinct, the upper parts being grayish rather than olive green, and the yellow speculum so reduced that in many cases only a faint trace of yellow is visible.

***Euphagus carolinus nigrans*, new subspecies**
Newfoundland Rusty Blackbird

Characters.—Similar to *Euphagus carolinus carolinus*, but males more intensely black both above and below, the gloss of the entire body being

more bluish and less green. Females a darker, clearer gray, with the upperparts, as in the males, perceptibly glossier and bluer. Young in first fall plumage distinct from *carolinus* in having the brown of the upper parts much darker, approaching chocolate, rather than sooty brown. No appreciable size difference is apparent.

Measurements.—Average of 7 adult males: Wing, 117.2 mm.; tail, 92.1; exposed culmen, 18.1; average of 3 adult females: Wing, 108.6 mm.; tail, 82.3; exposed culmen, 17.5.

Type.—Adult male, No. 394218, United States National Museum, Fish and Wildlife Service collection; Stephenville Crossing Newfoundland; May 20, 1947; Thomas D. Burleigh, original number 10329.

Distribution.—Newfoundland and the Magdalen Islands, in the Gulf of St. Lawrence.

Specimens of Euphagus carolinus nigrans examined.—Total number 16, from the following localities in Newfoundland: Tompkins, 2; Stephenville Crossing, 2; Corner Brook, 1; Badger, 1; Dunville, 1; Cow Head, 1; Maiden Arm, Hare Bay, 2; and Roddickton, 1; also Magdalen Islands, Quebec, 5.

Remarks.—The type locality of *Euphagus carolinus*, as given in the 4th edition of the A.O.U. Check-list, is Carolina (= South Carolina). In accordance with the restriction of other Linnaean species based on the work of Catesby in the vicinity of Charleston, South Carolina, the type locality of *Euphagus carolinus* is herewith restricted to that city. The rusty blackbird occurs as a common winter resident about Charleston, so before the Newfoundland birds were named, it seemed advisable to determine what race is represented by birds wintering on the South Carolina coast. Five specimens of *Euphagus carolinus* in the collections of the Charleston Museum, taken in the vicinity of Charleston, were made available for our examination. Four of these were found to have the dull black coloration, while a single specimen was of the deeper coloration typical of birds breeding in Newfoundland. Therefore, assuming that the continental breeding form is the commoner wintering bird in the Charleston region, the name *carolinus* is applied to it and the new name *nigrans* is assigned to the Newfoundland population. Three specimens from Labrador, an adult male taken at Groswater Bay on July 13 (year not given) and 2 immature males collected at Nain Bay on August 3, 1928, have none of the characters of *nigrans*, and adequate series from Ontario and the mainland of Quebec show the birds of this province also to be typical *carolinus*. On the other hand 3 males and 2 females taken in June on Grosse Isle, Magdalen Islands, are referable to *nigrans*.

***Carpodacus purpureus nesophilus*, new subspecies**

Newfoundland Purple Finch

Characters.—Similar to *Carpodacus purpureus purpureus*, of the north-eastern United States and eastern Canada, but upperparts in both sexes decidedly darker. Pileum of adult males deep, maroon purple, in contrast to the deep wine purple of *purpureus*. Underparts duller and lacking the pinkish tinge of the nominate race. Females and subadult males less olive above, with the whitish streaks of the back broader and more numerous. In size, both sexes average slightly larger than *purpureus*.

Measurements.—Average of 3 breeding males: Wing, 84.3; tail, 57; exposed culmen, 11.8. Average of 2 subadult males: Wing, 70 mm.; tail, 55.2; exposed culmen, 10.8. Average of 4 breeding females: Wing, 80.7 mm.; tail, 57.5 exposed culmen, 10.7.

Type.—Adult male, No. 394070, United States National Museum, Fish and Wildlife Service collection; Stephenville Crossing, Newfoundland; May 23, 1947; Thomas D. Burleigh, original number 10337.

Distribution.—Newfoundland, as far as now known.

*Specimens of *Carpodacus purpureus nesophilus* examined.*—Total number 9, from the following localities in Newfoundland: Tompkins, 4; Stephenville Crossing, 2; South Brook, 1; Grand Falls, 1; and Glenwood, 1.

Remarks.—The type locality of the Eastern purple finch, *purpureus*, as cited in the 4th edition of the A.O.U. Check-list, is based on Catesby's plate of this species, and is given merely as South Carolina. The actual specimen from which the painting was made was probably taken on the coast, and within a reasonable distance of Charleston, where the species occurs as a migrant, so this city is herewith arbitrarily designated as the type locality of *Carpodacus p. purpureus*. Specimens examined from this general area were all found to be referable to the lighter colored mainland race, so *purpureus* is applicable to this breeding population, leaving the distinct Newfoundland race available for the above proposed new name *nesophilus*. There are apparently no records for the occurrence of this species in Labrador, and no material from the Maritime Provinces of Canada was available in connection with this study, so the range of *nesophilus* as now known is confined to Newfoundland. Breeding birds from Ontario were found to be typical of *purpureus*, with no suggestion of intergradation with a darker race.

Pinicola enucleator eschatosus Oberholser. Newfoundland Pine Grosbeak.

Despite the diversity of opinion concerning the validity of *eschatosus* we are convinced, after a critical study of our series of 36 pine grosbeaks taken at various times of the year and in all parts of Newfoundland, that this race is worthy of recognition. Compared with *leucura*, it was found to be decidedly smaller and darker, these characters being constant regardless of season or age. Specimens personally taken in Labrador in 1944, a female at St. Peters Bay on August 7, and a male at Hawkes Harbour on August 14, were noticeably lighter and had wing measurements appreciably larger than comparable specimens from Newfoundland, so unlike some other Newfoundland races, *eschatosus* apparently does not occur in Labrador. A male from Nova Scotia, however, taken on Cape Breton Island on July 4, 1942, is typical of *eschatosus* both in respect to size and color, so it is possible that this race is not limited entirely to Newfoundland. During 3 days of field work in 1945 on the French islands of St. Pierre and Miquelon, we took a single pine grosbeak, a female, on Little Miquelon, on July 20. This was found to be indistinguishable from Newfoundland birds which further strengthened our opinion as to the validity of *eschatosus*.

Melospiza melodia melodia (Wilson). Eastern Song Sparrow.

It was of decided interest to us to find no characters in our series of 17 breeding song sparrows from Newfoundland whereby the Newfoundland birds could be separated from those of typical *melodia* from the Maritime Provinces of Canada and the northern New England states.

Our specimens were critically compared with a series from this region and they proved similar in every respect. As a species, *Melospiza melodia* seems to respond readily to a changed environment, the large number of subspecies now recognized attesting to that fact, so it is logical to assume that the song sparrow is a relatively recent addition to the avifauna of Newfoundland. At present, it is limited as a breeding bird to the southwestern corner of Newfoundland, but it is locally common and apparently thoroughly established there.

Fish and Wildlife Service,
Moscow, Idaho
and
Charleston, South Carolina

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PROCEEDINGS
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THE CALIFORNIA PLETHODONT SALAMANDER,
ANEIDES FLAVIPUNCTATUS (STRAUCH), WITH
DESCRIPTION OF A NEW SUBSPECIES AND NOTES
ON OTHER WESTERN *ANEIDES*

BY GEORGE S. MYERS AND T. PAUL MASLIN
Stanford University and University of Colorado

The Santa Cruz Mountains, a section of the outer Coast Range of California, form the backbone of the peninsula which confines the southern arm of San Francisco Bay. These mountains are highest and most rugged in the Big Basin Area north of the city of Santa Cruz; they narrow and lose height northward towards the city of San Francisco, which rests on the tip of the peninsula. The Santa Cruz Mountains form practically the southernmost end of the wet coastal redwood (*Sequoia*) belt and therefore mark the southern end of the range of a number of vertebrate species, among these being the salamanders, *Dicamptodon ensatus* and *Aneides flavipunctatus*. The purpose of this paper is to discuss the latter, to distinguish its southern race, and, incidentally, to discuss other western forms of the genus.

Comparatively little has ever been published on *Aneides flavipunctatus*, and almost all of this is contained or summarized in the papers of Cope (1889, pp. 187-189), Van Denburgh (1895), Storer (1925, pp. 119-124), Dunn (1926, pp. 220-223), Slevin (1928, pp. 66-69), Myers (1930, pp. 60-61), and Bishop (1943, pp. 336-339). The entire range of the animal is within the state of California, extending from the Santa Cruz Mountains northward through the coastal region to Shasta and Humboldt Counties. It is in the southern segment of the range that naturalists have most frequently seen the species. Generations of Stanford zoology students, beginning with Van Denburgh, have roamed the nearby habitat of *A. flavipunctatus* and have become familiar with the animal and its habits. Little was known of the populations to the north of San Francisco Bay previous to the last fifteen years, but Wood (1936 and 1939) has published some notes on northern examples. Both of the present writers have collected *flavipunctatus* in the south and in the north, and the senior author recognized differences of the southern and northern populations over 18 years ago. Later, he examined the specimens in the California Academy and the Stanford Natural History Museum collec-

tions, and (in MS.) tentatively separated the southern race. When the junior author became his student at Stanford, a collaborative study was begun, which resulted in the present paper.

A. flavipunctatus is a very distinctive species, not closely related to any other. Within the genus *Aneides* it is in no sense a vicarious (allopatric) form, but widely overlaps the ranges of *A. lugubris* and *A. ferreus*, with neither of which it intergrades or is easily confused. Its elongate form, short legs, thick tail, and black or blackish color distinguish it sharply from the other three species of the genus.

Almost the only author who has discussed the relationships of *flavipunctatus* is Dunn (1926, p. 25). He says, in part: "In the genus as a whole, there is a fairly clear line of evolution from *aeneus* through *ferreus* to *lugubris*, with *flavipunctatus* as an aberrant offshoot from some form more primitive than exists today in the West." The authors do not entirely agree with Dunn and offer their own conception of the relationships.

Both *aeneus* and *flavipunctatus* have unflattened jaw teeth, while *ferreus* and *lugubris* have them flattened. The latter type of dentition is undoubtedly the more specialized, and Dunn has placed considerable faith in this specialization as a phylogenetic indicator. While agreeing that the character is important, it is nevertheless worth pointing out that the presence of a single specialization, or the retention of a more primitive type of the same organ, in a genus which must have had a long history and now possesses but four species, may be misleading if it is depended on too heavily as an indicator of relationship among the living species.

Adults of *flavipunctatus* resemble those of *lugubris*, and differ from large *ferreus* and *aeneus*, in several characteristics—the greatly swollen temporal muscles (especially in males), the robust and almost round body, the heavier tail, more robust legs, the smaller eyes, the type of coloration (a plain ground-color with a sprinkling of small discrete spots versus a ground-color largely obscured by greenish, grayish, or brassy marbling), the more highly developed "smiling" contour of the jaws, and a stronger tendency to remain on the ground and not to climb, at least in most habitats. It has not been generally recognized that this last is a characteristic of *lugubris*, in spite of the fact that it does occasionally climb oaks and breed in them. It is probable that *lugubris* breeds on the ground more often than in trees. *A. aeneus* and *ferreus* are inveterate climbers, *lugubris* somewhat less of a climber, and *flavipunctatus* a ground dweller. In any event, the set of characters mentioned above appears to indicate a much closer relationship between *lugubris* and *flavipunctatus* than Dunn was inclined to postulate. On the other hand, Dunn and others have indicated the similarity of *ferreus* to *aeneus*, and these two animals, one on the Pacific coast, the other in the Appalachians, are remarkably alike. They seem to be more closely related, phylogenetically, than either is to *lugubris* or *flavipunctatus*. Naturally, it must be recognized that the set of adult characters which set *flavipunctatus* and *lugubris* apart are mostly not evident in the young, which greatly resemble both the young and the adults of *ferreus* and *aeneus*. It is possible that we have here one of those not uncommon instances of "arrested development," in which some of the species of a genus never attain certain characteristics shown by the adults of other congeners. Neither *ferreus* nor *aeneus* reach as great a length as *flavipunctatus* and

lugubris. Despite the possibility that the chief differences between these two pairs of species may be largely a matter of developmental physiology, the authors believe that each represents a rather different evolutionary line, that Dunn's assumption of close relationship between *lugubris* and *ferreus* is at least questionable (Dunn, 1926, pp. 210 and 219), and that *flavipunctatus* is not necessarily a descendant of an *Aneides* "more primitive than exists today in the West" (Dunn, 1926, p. 25), if other characteristics besides the flattening of the jaw teeth are considered in determining what is "primitive."

Continuing our discussion of *flavipunctatus*, it may be noted that this salamander is more hydrophilous than *lugubris* or *ferreus*. It is the only *Aneides* which we have found in water under stones along the edges of a brook, in a habitat similar to that of *Desmognathus fuscus* (Los Gatos Creek, Santa Clara Co., and near Felton, Santa Cruz Co.). North of San Francisco Bay, we have seen it in shaly rock-slide seepages, and our material from Clear Lake was taken in a dripping wet pile of rocky rubble at the end of a horizontal mine shaft. At Waddell Creek, adults and young were found on a dark, misty afternoon under wet boards and sticks on the flat land near the creek. The animal appears to forage at night, for in the forest between Guerneville and Trenton, Sonoma Co., examples were taken at night, in the rain, when they were walking about in the open.

Neither *lugubris* nor *ferreus* is found commonly in such wet habitats as seepages, piles of dripping stones, or the edges of brooks. The former species is usually taken under bark, boards, or other debris on the ground, and usually in much drier surroundings, even during rain. One example taken during wet weather from beneath leaves and humus half-way up the trunk of a palm may have been attempting to escape greater moisture on the ground. In the dry season, the open-land *lugubris* ordinarily retreats into the deep cracks in the ground occasioned by the drying of the top-soil (whence they may often be driven during the summer by prolonged running of water from a garden hose into such cracks), whereas *flavipunctatus*, more a forest species, appears to congregate near springs and brooks. The senior author has found *ferreus* to be most easily found, during the wet season, by looking for felled logs (never redwood) which have not begun to rot, but from which the bark of the butt-end has begun to loosen. During the daytime, almost every such log seen along the Redwood Highway harbored one or two *ferreus*, peering out from just within the shadow of the bark on the upper side of the log. Such "*ferreus* logs" could easily be "spotted" from a moving automobile. Few examples were found under bark or boards on the wet ground, and none in soggy rotten logs or beneath the bark of inclined logs whose fall had been arrested by other trees. The preferred habitat seemed to be the driest one available which would still shelter the beast, prevent dessication, and allow free space for rapid retreat. Parenthetically, it may be said that the retreat is lacertilian in speed; *flavipunctatus* is much slower in escaping, whereas *lugubris* is almost invariably the most sluggish of all western salamanders.

In distribution, *flavipunctatus* is nearly always found only in forested country, even though the microhabitat may not be shaded. Probably this is correlated with this salamander's need for moisture, and deforestation may have greatly restricted its range. Southward, the species is

almost entirely confined to the fog belt of the outer Coast Range and Bishop's map (1943, p. 233) errs greatly in extending the southern range over twice as far inland as the animal is found. The species does not occur east of San Francisco Bay, and is not even found in the lowlands west of the Bay. It is possible that Dunn's records for Palo Alto and Mountain View (Dunn, 1926, p. 223) were based on old examples taken before well-pumping had reduced the underground water-table and desiccated the west-bay lowlands, but it is our opinion that the species was not, within historic times, found here. One must go to the foothills of the Santa Cruz Mountains, four or five miles west of Stanford, Palo Alto, and Mountain View, to reach the habitat of *flavipunctatus*. On the other hand, *lugubris* is much rarer in the coastal fog belt than it is inland, in drier country.

One more characteristic of *flavipunctatus*, shared also with *lugubris*, deserves mention. Individuals confined together frequently bite each other severely, their teeth leaving great gashes in the skin (Myers, 1930, p. 61). Although we have no personal observations to record for *flavipunctatus*, *lugubris* should not be held too tightly in the collector's hand; the senior author has been severely bitten by a half-grown *lugubris* so held, so severely that a bandage was necessary to stanch the flow of blood. Presumably *flavipunctatus*, with its strong jaw muscles, could bite as strongly. No *ferreus* has been observed to bite another, or the collector.

Anceides flavipunctatus was apparently first named by Strauch in 1870, but the correct application of this name was not recognized until Storer (1925) showed that it seems to refer to the present species. We have not seen the original, but Storer reprints Strauch's description *verbatim*. Strauch's type locality is given as "*Californien (Neu-Albion)*" and the type was collected by Wosnessensky. In a footnote (p. 120) Storer mentions that Dr. E. C. Van Dyke says Wosnessensky was in California in 1840 and 1841 and collected mainly at old Fort Ross, Sonoma County, at New Helvetia ("Sutter's Fort," now Sacramento), and at San Francisco. Storer and, following him, other modern writers, have stated that Wosnessensky probably got the type of *flavipunctatus* somewhere in Sonoma County.

It will be recalled that "New Albion" (or better, "Nova Albion") was the name bestowed upon coastal California in 1579 by Sir Francis Drake, when he landed at some as yet unidentified spot (most probably the modern Drakes Bay) north of San Francisco and took possession of the land in the name of Queen Elizabeth. He affixed an inscribed brass plate, bearing, among other things, the name "Nova Albion," upon a "faire great poste" in token of his deed, and this is duly recorded in Hakluyt's *Voyages* and elsewhere. The name "New Albion" was thus widely known, if unused, although the plate was lost sight of until its dramatic reappearance in 1936. It had been found in 1933 a mile and a half inland from Drakes Bay, and discarded by its finder near San Quentin, where it was rediscovered in 1936 by a picknicker and brought by him to the University of California.¹ It is therefore evident that "New Albion" referred to a land of indefinite extension and it remains

¹For the history of Drake's plate, see Calif. Historical Soc. Quarterly, vol. 16, no. 1, part 2 (special issue, "Drake's Plate of Brass"); also pp. 192, 271, and 275 of the same volume; and vol. 17, no. 4, part 2 (special issue, "Drake's Plate of Brass Authenticated").

to be seen if the collector of the types of *flavipunctatus* so applied it.

Dr. E. C. Van Dyke, of the California Academy of Sciences, has referred us to the excellent account of Wosnessensky in Essig (1931, pp. 777-789). Ilya Gavrilovich Wosnessensky, also spelled Vosnesensky (1816-1871), was a zoological collector for the Academy of Sciences in St. Petersburg, who collected, among other things, the types of *Salamandrella wosnessenskyi* (Strauch). Essig quotes Wosnessensky's own brief account of his sojourn in California, during which time (July 20, 1840 to September 3, 1841) the Russian traveller was the first to climb and name Mt. St. Helena, in what is now the northwestern tip of Napa County. Wosnessensky says, in part: "... I left New Archangel July 7th and reached the coast of New Albion, the Ross Colony [Ft. Ross, Sonoma County], July 20." From this statement it is evident that Wosnessensky used "New Albion" as a general name for the area of coastal Alta California north of San Francisco, and there is nothing to show that he did not include the whole block of territory north of San Francisco Bay, perhaps even as far inland as New Helvetia (Sutter's Fort, now Sacramento). The three types of *flavipunctatus* might have come from anywhere in Sonoma County or from Napa County, and the fact that they bore large whitish spots indicates strongly that they did not come from the immediate coastal area at Bodega or Ft. Ross, where the species appears to bear only small spots, if any at all. Our guess is that the place of collection was rather far inland, perhaps near Mt. St. Helena, since the nearest approach to the coloration described by Strauch, among the Stanford material of the species, is seen in Clear Lake examples (in mine shaft on border of Clear Lake, one half mile northwest of Lucerne). Incidentally, it would appear to be strange that Strauch chose the name *flavipunctatus* (yellow-dotted) since he describes the spots as "whitish," but he says that this is so only in the two specimens from which the "epidermis is stripped," and that in the one in which the epidermis is "present in places," the spots are light brownish yellow. In live examples the spots, when present, are usually bluish white to pale cream in color. They are never yellow, in our experience.

Strauch (see Storer, pp. 121-122) says that his *flavipunctatus* is "überall tief schwarz gefärbt und mit recht grossen, unregelmässig geformten und gestellten weisslichen Makeln verziert." Cope (1883, pp. 24-25) says that the type of his nominal species *Plethodon iëcanus* "is black everywhere, and the superior surfaces are dusted over with minute white flecks." Cope's type was from Baird (the old U. S. Fish Commission Station), McCloud River, Shasta County, and subsequently collected specimens from the same place are said by Cope (1889, p. 188), to have the superior surfaces and sides of the head, body, and tail dusted rather thickly with small subequal bluish-white spots, much as are seen in *Plethodon glutinosus*. Baird forms perhaps the most northeasterly limit of the range of *flavipunctatus*, and the point at which the species extends farthest inland. (Baird is now flooded by Shasta Dam.)

The senior author (Myers, 1930, p. 60) noted that all adults south of San Francisco Bay are unspotted. Unspotted examples also exist north of the Bay, but these appear to be restricted chiefly to the coastal fog or redwood belt. Mr. Leo Shapovalov of the California Division of Fish and Game, at Stanford, long ago discovered that some half-grown and adult northern unspotted specimens from the redwood area are distinctly

greenish in color, but we can add that only young examples from south of the Bay ever exhibit any greenish color. On the other hand, the majority of northern adults possess spots, and those from farthest inland are usually the most heavily spotted.²

Both of the writers are opposed to excessive subspecific splitting. Animals usually are distributed in more or less isolated colonies of varying size and composition, and the larger, recognizably different populations are usually compounds of smaller and often recognizably different ones. Splitting of these nomenclaturally could go on almost *ad infinitum*. However, we feel that the southernmost population of *A. flavipunctatus* is a recognizable entity worthy of subspecific recognition. For one thing it is completely cut off, geographically, from the northerly populations by San Francisco Bay. In spite of this we recognize that certain coastwise populations north of the Bay are very similar to the southern animals, but the time at our disposal has not allowed a complete enough study of the entire species to determine whether some of the northern coastal *flavipunctatus* ought to be referred to the southern race we are describing.

***Aneides flavipunctatus niger*, new subspecies**

Holotype.—Stanford Natural History Museum 2938; from near the forks of Waddell Creek, Santa Cruz County, California; collected on March 17, 1929, by G. S. Myers and the late Merrill W. Brown. This is the 152 mm. specimen recorded by Myers (1930, p. 60); it is now 150 mm. in total length. The specimen is unique in having lost the right fore-foot.

Paratypes.—262 specimens, as follows:

Natural History Museum of Stanford University, Amphibian Nos. 8, Los Gatos, Santa Clara Co.; 68-70, 72-74, Stevens Creek, Santa Clara Co.; 843, Mountain View, Santa Clara Co.; 898-899, Boulder Creek, Santa Cruz Co.; 1642-1643, Murphys Creek, north of Mt. Madonna, Santa Clara Co.; 2718, 2939-2940, same data as holotype; 2810-2823, Los Gatos Creek, 3 to 4 miles west of Los Gatos, Santa Clara Co.; 3726, Felton, Santa Cruz Co.; 4126-4137, Skyline Boulevard, 5 miles south of junction with present La Honda Road, San Mateo Co.; 4471-4472, near Alpine Creek, San Mateo Co.; 5220-5221, tributary of Campbell Creek, at Long Bridge, Santa Clara Co.; 6405, Skyline Boulevard, 2 miles north of junction with old Saratoga Road, Santa Cruz Co.; 6527-6531, Stevens Camp, off Waddell Creek, Santa Cruz Co.

California Academy of Sciences Nos. 13363, 13385-13395, 13409-13414, 20994-20996, 33396, 40462-40467, 53977-53979, 53995-53996, 63779-63792, 63798, all from Los Gatos, Santa Clara Co.; 80293-80297, 81324-81336, Congress Springs, Santa Clara Co.; 80328-80337, 81312-81323, 2 miles west of Felton, Santa Cruz Co.

University of California, Museum of Vertebrate Zoology Nos. 8261, Los Gatos, Santa Clara Co.; 12207-12208, 20 miles southwest of San Jose, Santa Clara Co.; 13801-13806, 16052-16053, Ben Lomond, Santa Cruz Co.; 18002-18003, Head of Mindeyo Creek, San Mateo Co.; 27805-27858, 1½ miles west of Felton, 1000 ft., Santa Cruz Co.

²Since our paper was completed, Hilton (1948) has recorded, as *Aneides flavipunctatus*, a peculiar salamander from the Mt. Hood region of Oregon. Judging solely by Hilton's description and figure, we believe this to represent a new species, well distinguished from *flavipunctatus*.

University of Colorado Museum Nos. 1335.1-1335.19, Congress Springs, 1.3 miles west of Saratoga, Santa Clara Co.; 1336.1-1336.2, 4.3 miles west of Saratoga, Santa Clara Co.; 1337.1-1337.3, The Forks, Waddell Creek, Santa Cruz Co.; 1338.1-1338.21, 1 mile west of Felton, 1000 ft., Santa Cruz Co.

Diagnosis.—A form of *Aneides flavipunctatus* in which the color of half-grown and adult examples is invariable a shiny black (hence the name *niger*, shining black) without light spots or speckling, in which the cloacal lips are black, and in which 90 percent of the individuals measured show a figure of .80 or less in the proportion: length of forelimb plus length of hindlimb divided by distance from armpit to groin.

Discussion.—Aside from the character pertaining to the presence or absence of spots a number of other characters were examined with the intent of determining whether additional morphological differences existed. A number of these characters show significant statistical differences but are of little diagnostic value. Among the characters examined are the following:—

1. Number of costal grooves between fore and hind limbs.
2. Number of costal folds between appressed fore and hind limbs.
3. Body length to anterior edge of cloacal fold.
4. Tail length from anterior edge of cloaca to tip of tail.
5. Head length to gular fold.
6. Head width.
7. Length of forelimb.
8. Length of hindlimb.
9. Relative length of digits.
10. Distance between axilla and inguen.
11. Relative development of the gular fold.
12. Width of the tail at midpoint.
13. Height of the tail at midpoint.
14. Number of vomerine teeth.
15. Disposition of vomerine teeth.
16. Color of cloacal lips.

In the southern form there is a distinct tendency to develop more costal grooves. Here they are thirteen in number with an occasional individual showing fourteen. These counts exclude the half groove dorsal to the inguen. The northern individuals never have more than thirteen grooves, and frequently only twelve are present. Furthermore, half grooves dorsal to the inguen are also unusual. The number of grooves present shows a high correlation with the actual distance between the axilla and inguen. This distance averages about 41 mm. in southern specimens and about 35 mm. in adults of northern individuals. Such data, however, are of little value in identifying individuals, for sexually mature forms vary greatly in size. But because of the difference in axilla-inguen length there is an appreciable difference in the distance between the toes of the appressed limbs. This distance is ordinarily measured in terms of costal folds but because of the size of this unit, differences between northern and southern forms, expressed in terms of costal folds, is diagnostically unsuitable. If this character, however, is described in the form of the ratio, length of forelimb plus length of hindlimb divided by distance between axilla and inguen, a fairly diagnostic character is avail-

able. In 90% of the southern individuals this ratio is less than 80. and in 90% of the northern individuals it is greater than .80.

Other measurable characters showing slight differences of little diagnostic value were also observed. The ratio of head diameter to head length indicates that the southern form has a relatively broader head. This is in part a reflection of the differential development of the masseter muscles. But as this is a sexually dimorphic character it loses much of its value for diagnostic purposes. There is also a difference in the ratio of the diameter of the tail to the height of the tail measured at a point half way to the tip. This averages greater in southern forms. The character, however, is not reliable in diagnosing individuals, for large specimens tend to have rounder tails, and the shape of the tail varies considerably with the condition of the specimen.

An additional color character difference exists which has some diagnostic value. As the character is a relative one it is difficult to make use of unless comparative material is available. The lips of the cloaca of northern specimens are white or nearly white while those of southern specimens are black.

It should be pointed out again that the young of both the southern and northern forms are minutely speckled with white, as is usual in the genus *Aneides*. But in addition to this speckled pattern there are color differences of a rather conspicuous nature. These differences are most striking in living individuals. No analysis has been made of these differences for two reasons; living material of both forms has not been available simultaneously; and no satisfactory differentiation has been made as yet between the young of the sympatric species *A. flavipunctatus* and *A. ferreus*.

The name *Aneides flavipunctatus flavipunctatus* is applied tentatively to all of the populations north of San Francisco Bay, but with the express notation that we are doubtful of the systematic status of the coastwise population in Sonoma and more northern counties, which is similar in many respects to *niger*. We consider that material from eastern Sonoma, from Napa, and from Lake counties probably will eventually be considered a separate subspecies, and that the name *Aneides flavipunctatus flavipunctatus* may properly be applied to it. We do not have sufficient material at hand to do more than guess at the status of the far northeastern population to which the name *iecanus* applies. Certainly it is spotted and certainly it is not identical with *niger*.

Distribution.—The range of *niger* is well illustrated by the localities in the list of paratypes. Briefly, it is delimited by the wooded Santa Cruz Mts., and is almost all included within western Santa Clara, northern Santa Cruz, and southernmost San Mateo Counties. It is separated from the northern populations by most of San Mateo and all of San Francisco Counties south of the Golden Gate, and by Marin County on the north, although it is rather expected that *flavipunctatus* will eventually be found in Marin County.

Acknowledgements.—We wish to thank Mr. J. R. Slevin of the California Academy of Sciences and Mr. Thomas Rodgers, formerly of the Museum of Vertebrate Zoology of the University of California, for allowing us access to the collections of those institutions. The present study was made in the Natural History Museum of Stanford University, in 1940-41.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW MINK FROM THE FLORIDA EVERGLADES

BY W. J. HAMILTON, JR.

During biological investigations in Collier County, Florida, I have made efforts to secure mink, which have been reported in the cypress swamps of the Everglades. A single specimen, victim of highway traffic, was taken in the late winter of 1947. This individual differs markedly from the mink of northern Florida and is herewith described as

Mustela vison evergladensis, subsp. nov.

Type locality.—Tamiami Trail (U. S. Route 94), 5 miles southeast of Royal Palm Hammock, Collier County, Florida.

Type specimen.—Female adult, skin and skull; No. 3850 Cornell University Museum; collected March 7, 1947, by William J. Piper.

Range.—Unknown, but presumably the cypress and mangrove swamps of the Florida Everglades and Ten Thousand Islands.

Diagnosis.—A small dark, silky furred mink. Color approximating *Mustela v. vison* but darker, particularly the head and throat. White chin spot absent. Tail dark brown, the distal half darker. This small mink is very distinct from *Mustela vison lutensis* of the north Florida salt marshes, both in size, color, and pelage. Contrasted to the coarse yellowish brown fur of *lutensis*, *evergladensis* has a soft dark dense pelage. The dorsal part of the neck is streaked sparingly with white hairs, a characteristic, presumably, of age. *Evergladensis* differs from *Mustela vison vulgivagus* in its much smaller size and lighter dentition. The color is somewhat darker than in *vulgivagus*.

Measurements.—The type measures: Total length, 441; tail vertebrae, 137; hind foot, 48. The skull, although badly crushed, indicates the following characteristics: greatest length, 51; condylobasal length, 48 (both measurements from skull before cleaning); length of mandible, 33; length of upper molar row, 15; length of lower molar row, 17.3. The cheek teeth are similar to typical *vison*, the last molar being somewhat smaller in the Florida form; these teeth are much smaller than in *lutensis*.

Remarks.—Mink are presumably scarce in the tropical region of Florida. Ransome I. Page informs me that a mink was holed by dogs some years ago a few miles south of Naples, Florida. William Piper, who took the type, has spent a lifetime in the Everglades as a professional collector and has seen not more than five mink, all within six miles of the point where the type was taken. Diligent inquiry only serves to indicate the relative rareness of the mink in the southern part of the Florida Peninsula. The type is a nursing female, with six swollen mammae, indicating that mating occurs in the Everglades region during January, at least a month earlier than in northern latitudes. Mink apparently do not occur in the central part of the Florida Peninsula. Hide dealers in Orlando, Florida have no knowledge of this animal occurring in the central part of the Peninsula. While they handle many hundreds of raw furs annually, mink have never been presented to these buyers.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GENUS OF MAYFLIES FROM WESTERN
NORTH AMERICA (LEPTOPHLEBIINAE)

BY GEORGE F. EDMUNDS, JR.

In early September of 1947 the writer reared adults of *Thraululus albertanus* McDunnough from nymphs collected from the Green River at Hideout Canyon, Daggett County, Utah. A comparison of both nymphs and adults of *albertanus* with Eaton's figures (Revis. Monog.: pls. 12, 35) of *Thraululus belum* Eaton, the generotype* of *Thraululus* reveals sufficient morphological differences that in the opinion of the author it is necessary to erect a new genus for the North American species now placed in *Thraululus*. This new genus is herewith named *Traverella*† and *Traverella albertana* McDunnough, originally described in *Thraululus*, is designated as the generotype.

Genus *Traverella* new genus

Rather small mayflies with forewings about six to ten mm. long. Eyes of the male nearly contiguous above the head (fig. 3); eyes of the female separated by over three times their own diameter (fig. 5). Forelegs of male about two-thirds as long as wing; length of joints of foreleg of *albertana* in relation to the femur are, tibia 1.87, first tarsus .10, second tarsus .52, third tarsus .42, fourth tarsus .25, fifth tarsus .15, and claw .10. Claws dissimilar on all legs. Venation of the forewing as in figure 1; a few obsolete costal cross veins may be present in the costal space basad of the bullae; stigmatic cross veins simple, slightly aslant; outer fork of the radius (R_4+5) asymmetrical (Needham-Traver venational nomenclature), R_4 tending to follow the course of R_4+5 , R_5 sagging to the rearward basally; two cubital intercalaries present. Hind wings as in figures 2 and 4; small with a prominent costal projection slightly basad of the middle; about six to twelve well developed cross veins mostly grouped behind the costal projection; as many as twenty obsolete cross veins may be present behind R_1 ; subcosta terminates at a cross vein behind the costal projection; R_1 terminates in the anterior margin subapically. Male forceps three jointed (fig. 6), terminal joints short; a pair of caudally directed rod-like projections present on forceps base dorsad of forceps. Subanal plate of female with a small median V-shaped emargination in the apical margin (fig. 7). Tails subequal; a little

*Dr. R. V. Chamberlin, et. al., use "generotype instead of the more usual form genotype as being etymologically the correct form, the stem of genus being *gener-* and non *gen-*. There is also the advantage of distinctness from genotype as used by geneticists." (Chamberlin, R. V., 1947, Bull. Univ. Utah, Biol. Ser., 10, no. 5:5.)

†I take great pleasure in naming this genus in honor of Dr. J. R. Traver who has generously aided me in my studies on Utah mayflies.

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longer than body in female; more than one and one-half times as long as body in male.

Nymph depressed (fig.16). Head rectangular, as long as or longer than broad; head capsule constricted ahead of the eyes and antennae, expanded at clypeus; clypeus with a small median frontal projection; antennae about one and one-half times as long as head; labrum as wide as head capsule, with a deep median notch in the anterior margin; mandibles exposed dorsally in area between head capsule and labrum; maxillary palpi lie alongside the head; other mouthparts as figured (figs. 9, 11, 12, 14), similar to the Neotropical genus *Hermanella* (see Needham and Murphy, 1924, and Spieth, 1943). Prothorax wider than head capsule; a cluster of four or five spines near the lateral margins. Mesothorax as wide as or wider than prothorax. Legs depressed; claws with about twelve denticles, those on the prothoracic legs short and wart-like, those on meso and metathoracic legs usually well developed (fig. 8). Posterolateral corners of abdominal segments eight and nine developed into spines. Spinules present on the posterior margins of all tergites. All gills double, gill one largest, diminishing in size to gill seven; gills one to five bilamellate; each lamella with a fimbriate margin (fig. 10), the longest fimbriae being about as long as the body of the gill; posterior member of each pair about two-thirds to three-fourths as large as the anterior member; gill six similar to one to five except that the body of the posterior member is so reduced as to make the gill fibrilliform. Gill seven with both members fibrilliform, the posterior member smaller. The gill body is narrow on young nymphs and widens as they mature. Tails slightly shorter than body; median tail slightly longer than laterals.

A discussion of the Nearctic species of the genus *Traverella* follows.

Traverella albertana (McDunnough) 1931

Thraululus albertanus McDunnough, *Canad. Ent.* 63:82, 1931. Traver, *Biol. Mayflies*, p. 554, fig. 146, 1935.

Type locality.—Medicine Hat, Alberta. Also known from Saskatoon, Saskatchewan, and the Green River at Hideout Canyon and at Jensen, Utah.

Adult.—Specimens from the Green River at Hideout Canyon agree with McDunnough's original description except that the "bands of deep smoky" (McDunnough) on the abdominal tergites do not meet at the median line, thus leaving a pale median stripe. This stripe is quite evident in alcoholic material but is obscured in dried specimens.

Nymph.—Length: body 10, tail 9.5 mm. General ground color pale yellow brown; all spines and hairs light golden-brown. Head capsule with variable smoky markings but usually smoky near the ocelli; mandibles smoky on dorsal surface with a pale spot near the anterior margin; clypeus rounded on anterior margin with a small slightly elevated median projection; ocelli white, broadly ringed with black basally; eyes of the female and lower portion of eyes of male black, upper part of eye of male mahogany red. Pronotum pale yellow brown with all margins and submedian areas marked with smoky; a group of four or five spines on the lateral margins. Mesonotum pale yellow brown with smoky markings along the lateral margins and along the lines corresponding to the parapsidal furrows of the adult. Legs pale yellow brown except for the dorsal surface of the femur which is smoky in the central area. About

twelve denticles on each claw, those on the first claw usually short and wart-like, middle denticles on the middle and hind claws usually well developed, but variable in length (fig. 8). Tergites pale yellow brown with large smoky areas which arise along the entire lateral margin and extend nearly to the median line and arching forward from the postero-lateral corner thus leaving a pale median stripe and a pale triangular area on the posterior margin of each tergite. Gill six with body of the posterior member reduced so as to be fibrilliform; gill seven with both members present, fibrilliform (fig. 13). Tails pale yellow brown.

Biology.—Adults of this species started swarming over the sandy shores of the Green River as soon as the morning sun shone on the area and continued the nuptial flight until nearly 11:00 A.M. when the rapidly increasing temperatures reached 75°F. The flight took place from ten to twenty feet above the ground with the wings beating on both the ascending and descending portions of the vertical flight. This species emerges during late August and probably throughout September. In early September when the collections at the Green River were made, only an estimated one per-cent of the nymphs had the black wing pads which appear before emergence.

The subimagos started to emerge from the river at about 7:10 P.M. when the light intensity was reduced to approximately five foot candles. A great number of individuals emerged during the next twenty minutes and then they abruptly stopped as the light intensity dropped to less than one foot candle.

The Green River at Hideout Canyon varies in width from 150 to 500 feet and averages three to four feet in depth, except in the main channel which reaches a depth of eight feet. It carries considerable amounts of silt and sand at this point and deposits it continuously wherever the current is retarded. The water temperature fluctuated between 66° and 68° F. during the time of collecting. Much of the bottom is covered with shifting sand which constantly changes its profile but there are several outcroppings of rock and a long rocky rapid in the area in which collecting was done. The nymphs were associated with these rocks and were most abundant in the long rapid. Most of the rocks examined had but one or two individuals clinging to the underside but on some the nymphs were very numerous. One rock which had less than a square foot of surface area had more than a hundred nymphs on it, mostly on the underside. Associated mayfly nymphs were those of *Heptagenia elegantula* Eaton, *Tricorythodes* sp., *Baetis* spp., *Ephoron* sp., and *Lachlania* sp. The stomachs of channel catfish and roundtails which were collected from the river contained several young nymphs of *Ametropus albrighti* Traver and a portion of a carnivorous Siphonurine of an undetermined genus.

Traverella presidiana (Traver) 1934

Thraulius presidianus Traver, *Journ. Elisha Mitch. Sci. Soc.* 50:199-200, fig. 16, 1934. Traver, *Biol. Mayflies*, p. 555, figs. 146-147, 1935.

Type locality.—Presidio, Texas.

Adult.—The wing venation and terminalia place this species rather close to *albertana* and it is herewith transferred to the genus *Traverella*. The nymph is unknown (see remarks below).

Biology.—Unknown, the type emerged in August.

Traverella sp?

The nymphs described below were sent to the author by Dr. J. R. Traver who has generously permitted their description in this paper. The specimens from Zapata, Texas (Rio Grande River, February 26, 1936) were given to Dr. Traver by Dr. J. G. Needham who collected them. The specimens from Tamaulipas Province, Mexico (Rio Guayalejo, Dec. 22, 1939) were collected and given to Dr. Traver by Dr. Lewis Berner.

Nymph.—Length: body 7; tails 7 mm. General ground color pale yellow brown, all spines and hairs light golden brown. Head capsule with variable smoky markings (fig. 15); mandibles smoky on dorsal surface, a pale spot near the antero-median corner; clypeus with a large median spatulate frontal projection that extends beyond the anterior margin of the labrum, clypeus arched antero-laterally from the base of the clypeal projection; ocelli white, broadly ringed with black basally; eyes of the female and lower portion of eyes of male black, upper part of eye of male deep brownish orange. Pronotum yellow brown with smoky markings on lateral margins and smoky submedian streaks; a group of four or five spines present on the lateral margins. Mesonotum yellow-brown with smoky markings along the lateral margins and along the lines corresponding to the parapsidal furrows of the adult. Legs yellow brown except for the smoky distal third of the femur and variable patch near the middle of the segment; ventral side less distinctly marked than the dorsal side. About twelve denticles on each claw; those of the first claw short and wart-like; those of the second and third well developed but not as long as those of the third claw of *albertana*. Tergites mostly smoky with indications of a pale median line in some specimens, distribution of yellow-brown and smoky areas variable. Ventral side of head, thorax, and abdomen immaculate pale yellow brown. Gills as in *albertana* except that the posterior member of gill six is similar to the anterior member and the posterior member of gill seven is absent. Tails yellowish brown, darker basally.

Biology.—Mr. Stanley Mulaik who accompanied Dr. Needham at the time the nymphs were collected at Zapata, Texas, informs the writer that this area of the Rio Grande River has rocky areas very similar to those in the Green River where the nymphs of *albertana* were collected. It is possible that the nymphs were from these rocky areas. Dr. Berner (in letter) informs the writer that the Rio Guayalejo varies from 200 to 300 feet in width and is deep. He collected from clay bottom and from emergent vegetation in the slower parts of the stream and from a rapid in which there were large rocks covered with a layer of sticky gray clay. The underside of some of the rocks were smooth, others rough, while the upper sides were covered with caddisfly nets and moss. It is very probable that the nymphs came from these rapids.

Remarks.—The writer believes that the above described nymph is clearly congeneric with *albertana*. It differs from the latter species primarily in the presence of the large spatulate clypeal process and the differently shaped clypeus. The lamella of the posterior member of gill six is somewhat broader than that of *albertana* and the posterior member of gill seven is absent. In all other structures such as head shape, mouth parts, presence of spines on the pronotum, dentition of the claws, form of the gills, presence of spinules on the posterior margins of the tergites, and spines on the postero-lateral corners of tergites eight and nine, this

species is very similar to *albertana*. As this nymph has not been reared and because of the structural differences between this species and *albertana*, the nymphs of *Traverella* have been characterized from *albertana* alone. Traver (in letter) has "a suspicion that the nymph may be that of *presidiana* on the basis of the incipient genitalic structures as seen in one well advanced male nymph." Further evidence in favor of this view is the fact that the nymphs were taken from the Rio Grande River by Dr. Needham and that the type locality of *T. presidiana* is at Presidio, Texas which is on the same river.

There are numerous structural differences which justify the erection of the genus *Traverella* for the North American species formerly placed in the genus *Thraulius*. A discussion of the most obvious differences follows. References to the genus *Thraulius* are to *T. bellum*, the generotype. In the adult the distinct sag near the middle of the anterior margin of the forewing of *Thraulius* is absent in *Traverella*, and the outer fork (R_4+5) is nearly symmetrical in *Thraulius* but is distinctly asymmetrical in *Traverella*. The R_1 of the hind wing of *Thraulius* terminates in the anterior margin just beyond halfway from the costal projection to the apex while in *Traverella* it ends in the anterior margin subapically. The genital forceps of the two genera are similar but the penes differ markedly; the rod-like structures on the forceps base of *Traverella* are absent in *Thraulius*. The rounded apical margin of the female of *Thraulius* is entire but in *Traverella* has a medium V-shaped emargination. The nymph of *Traverella* is strikingly different than *Thraulius* in the form of the head and mouthparts. The gills of *Traverella* are similar to those on segments two to seven of *Thraulius* but the linear lanceolate first gills of *Thraulius* contrast with the fimbriate lamelliform first gills of *Traverella*. In the opinion of the writer *Traverella* is more closely related to the Neotropical genus *Hermanella* than to *Thraulius*.

In addition to the above named species some of the Mexican and Neotropical species now placed in *Thraulius* probably belong in *Traverella*. The genus *Thraulius* is excluded from the North American fauna by the placement of the only North American species in the genus *Traverella*. Traver's (1935) placement of *Thraulius* in the key to the adults of the genera of Leptophlebiinae and the description of the adults are based on *presidiana* and *albertana* and are therefore applicable to *Traverella*. However, the position of *Thraulius* in the generic key to the Leptophlebiinae nymphs and the description of the nymphs are based upon a true *Thraulius*. Nymphs of *Traverella* can not be placed in Traver's key but are readily distinguished from all North American Leptophlebiinae by the labrum which is as wide as the head and the fimbriate lamelliform gills.

Acknowledgements

I wish to thank Dr. R. V. Chamberlin and Dr. Don M. Rees of the University of Utah and Dr. J. R. Traver of the University of Massachusetts for reading and criticizing the manuscript, and to the latter also for the opportunity to describe the nymphs from Texas and Mexico. The writer is indebted to Dr. Lewis Berner for notes on the biology of the Mexican nymphs. I also thank the University of Utah Research Committee for a grant of travel funds which made the Utah collections and rearing possible.

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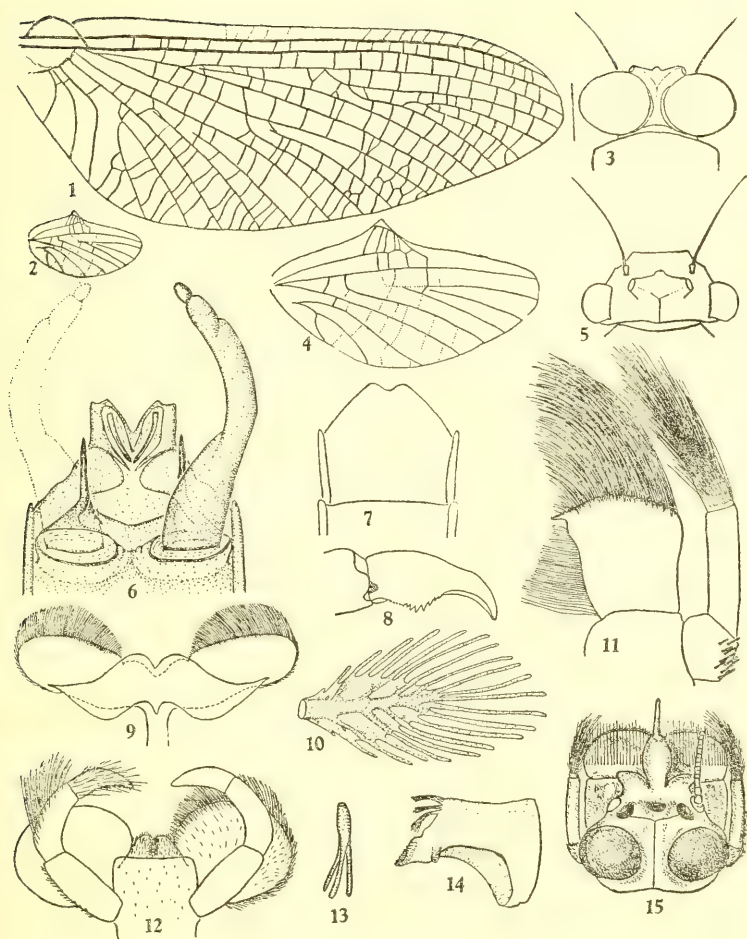
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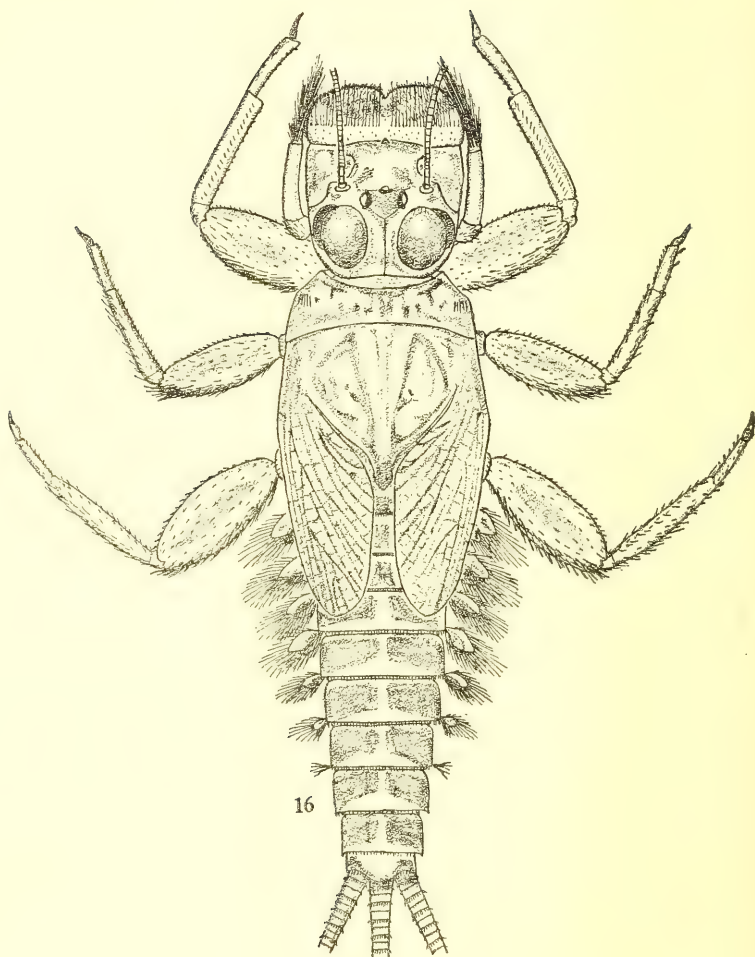
Plate V

- Figs. 1-7. Imago of *Traverella albertana*.
- Fig. 1. Venation of forewing.
- Fig. 2. Hind wing, to scale forewing.
- Fig. 3. Dorsal view of head of male.
- Fig. 4. Hind wing, enlarged.
- Fig. 5. Dorsal view of head of female.
- Fig. 6. Ventral view of terminalia of male.
- Fig. 7. Ventral view of subanal plate of female.
- Figs. 8-14. Nymph of *Traverella albertana*; all mouth parts to same scale; gills to same scale.
- Fig. 8. Metathoracic claw.
- Fig. 9. Hypopharynx.
- Fig. 10. Anterior member of first gill.
- Fig. 11. Right maxilla.
- Fig. 12. Ventral view of labium.
- Fig. 13. Anterior member of seventh gill.
- Fig. 14. Right mandible.
- Fig. 15. Head of *Traverella* sp.

Plate VI

- Fig. 16. Dorsal view of nymph of *Traverella albertana*.





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW GENERA AND SPECIES OF TINGIDAE
(HEMIPTERA)

BY CARL J. DRAKE

The present paper is based upon specimens in the collections of the U. S. National Museum, British Museum, Hungarian National Museum, and the writer. The deposition of types is given under the descriptions of new species. The new genera all belong to the subfamily Tinginae.

Ogygotingis, n. gen.

Head moderately long, deeply inserted, almost to hind margins of eyes, armed with seven long spines and two spiniform, antenniferous processes; four spines as in related genera; the extra pair (one on each side) near antero-inner edges of eyes; and the median spine placed posteriorly on top of the head between the eyes. Antennae long; indistinctly pilose; segment I long, twice as long as II; III long, slenderest; IV moderately long, shortly pilose. Eyes moderately large. Bucculae closed in front. Rostrum reaching mesosternum. Orifice present. Pronotum moderately convex, pitted, tricarinate; paranota narrow, areolate. Elytra divided into usual areas, the boundary between discoidal and sutural areas not very sharply defined. Apical segments of all tarsi greatly enlarged, broadly ovate.

Generotype, *Teleonemia insularis* China

This genus may be separated from all other genera of the Tinginae by the armature of head (7 cephalic spines) and the greatly enlarged apical segments of tarsi. The cephalic spines and swollen tarsal segments somewhat modify the characters of the subfamily Tinginae.

Gitava, n. gen.

Very elongate, with long appendages. Head short, deeply inserted, armed, with median longitudinal groove. Bucculae short, closed in front. Rostrum moderately long. Orifice present, rimmed. Hypocostal laminae uniseriate. Antennae very long; segment I long, stout, much longer than II; III very long, slenderest; IV moderately long. Pronotum convex, pitted, tricarinate; collar very short, raised anteriorly, truncate in front; paranota narrow, carina-like, wider at collar; hind process mucronate. Elytra long, narrow, divided into usual areas.

Generotype, *Tigava uganda* Drake.

Separated from *Tigava* Stal by the much shorter and more convex pronotum, and the lateral carinae are divergent anteriorly.

Xenotingis malkini, n. sp.

Head short, dark, concealed from above by paranota and small hood. Bucculae brown, moderately wide, meeting in front. Antennae long,

slender, brownish, indistinctly pilose; segments I and II very short, swollen, latter smaller and obconate; III very long, very slender, almost three times as long as IV; IV black, longer than first two conjoined. Rostral channel deep, narrow, open behind, laminae raised, areolate, brownish; rostrum brown, black at apex, extending on metanotum. Body beneath dark ferrugineous. Legs slender, moderately long, yellowish brown.

Paranota enormously developed, semi-globose, extending high over pronotum, with outer margins almost meeting above median carina, slightly longer than high, closely areolate beneath, the sides above widely areolate. Pronotum brown, slightly convex; median carina low, foliaceous, becoming obsolete at base of hind process; lateral carinae convex within, low, not present on hind process, extending anteriorly to calli, hood moderately large, very narrow, tectiform; hind process triangular, moderately large, areolate, brown. Elytra longer than abdomen, distinctly lacy in appearance; costal area moderately wide uniseriate, some transverse viens y-shaped and forming extra small cells within, completely reflexed and resting flatly on subcostal area; hypocostal ridge very strongly developed, as wide as costal area, in most part projecting downwards, the areolae smaller and largely triseriate; discoidal and sutural area finely reticulated. Wings long, smoky.

Length, 4.85 mm.; width, 2.00 mm.

Type (male) Hollandia, Dutch New Guinea, April, 1947, B. Malkin, in whose honor the insect is named, in U. S. National Museum. One paratype, taken with type. One elytron is missing in each specimen.

This species has the enormously developed hypocostal ridge as *X. bakeri* Drake from the Philippines. It is, however, much larger and much darker in color, and has the head concealed by paranota. In *bakeri*, the head is visible from above and the paranota extend farther back and cover the basal third of elytra.

Lembella polita, n. sp.

Small, pale brown or stramineous-brown, shiny, the viens of sutural areas fuscous, the areolae clear. Head long, not deeply inserted, short in front of eyes, convex above, with short, median tubercle in front; eyes rather small, black. Rostrum nearly reaching base of mesosternum. Bucculae short, open in front. Orifice present, with an elongate, transverse canal. Body beneath reddish brown, shiny. Male claspers large, curved. Legs slender, brown. Antennae slender, long, smooth, brown; proportions—I, 10; II, 5; III, 40; IV, 18.

Pronotum convex, shiny, finely pitted; median carina profound, non-areolate, the lateral carinae present only on triangular process; paranota wanting; collar short, distinct, truncate in front, finely biseriate; hind process triangular, long, terminating in a sharp point. Elytra narrow, jointly rounded behind in repose, considerably longer than abdomen, with small tumid area a little beyond middle of vein separating subcostal and discoidal areas, there widest part of elytra; costal area very narrow, with one row of very small areolae, the areolae slightly larger and elongate in widest part; subcostal and discoidal areas large, very finely areolate; sutural area large, finely areolate at base, widely areolate apically.

Length, 2.30 mm.; width, 0.52 mm.

Type (male), Kavluh, Sudan, and allotype (female) taken with type, Feb. 21, 1935, in Drake collection.

This species may be distinguished from *L. maynei* Schouteden by its color, the latter being largely pitchy black. *L. maculigera* Horvath is a much larger black species with the apical half of elytra testaceous and areolae clear.

Genus Baeochila Drake and Poor

Baeochila Drake and Poor, IOWA ST. COL. JR. SCI., XI 1937, p. 400, 1937, founded as a subgenus of *Cysteochila* Stal, is here raised to generic rank. The hood is moderately large, covers the median portion of the fore part of the pronotum, and protrudes only slightly beyond the front margin of pronotum. The pronotum is moderately convex and tricarinate. The paranota are completely reflexed but do not cover lateral carinae. The sides of the body are almost parallel. The pronotum is tricarinate, with paranota completely reflexed but not concealing lateral carinae. Orifice is distinct; hypocostal ridge uniseriate. Head deeply inserted, the hind margins of eyes touching pronotum.

Generotype, *Cysteochila elongata* Distant, 1903. A second species is described below.

***Baeochila scitula*, n. sp.**

Very similar to *B. elongata* (Distant) but smaller, with shorter pronotum and shorter hood. Head chestnut brown, moderately long, with five, stout, blunt, moderately long, appressed, testaceous spines. Eyes black. Antennae testaceous, moderately stout, smooth; segment I and II stout, very short, the latter slightly shorter and slightly thinner; III long, three times as long as IV; IV narrowed basally, mostly brown. Rostrum brown, extending to middle of metasternum; laminae whitish testaceous, widely separated, open behind. Body beneath brown; orifice elongate, the rim raised. Bucculae brown, closed in front.

Pronotum moderately convex, pitted, sharply tricarinate, the lateral carinae parallel. Hood longer than high, somewhat compressed laterally, rounded, the crest above calli. Paranota large, resting on dorsal surface of pronotum, nearly touching the lateral carinae on pronotal disc. Elytra with sutural areas finely areolate basally, overlapping in repose; costal area narrow, with narrow, elongate areolae; subcostal area narrow, wider than costal, uniseriate; discoidal area long, narrowed at base and apex, widest at middle, there six or seven areolae deep. Legs brownish.

Length, 3.00 mm.; width, 0.76 mm.

Type (male) and 3 paratypes, Formosa, collected by Sauter, in Drake collection.

In *elongata* Dist., the hood is a little higher and the crest placed farther forward. I am indebted to Mr. W. E. China for comparing this species with the type of *B. elongata* (Distant).

***Perissonemia sodalis*, n. sp.**

Moderately large, elongate, dark fuscous-brown. Head with spines greatly reduced or absent; eyes large, reddish. Antenniferous tubercles short, blunt. Antennae stout, moderately long, clothed with short appressed, golden pile; segment I moderately long, stouter and about twice as long, fusiform, scarcely thickened, clothed with longer hair.

Rostrum reaching middle of mesosternum. Legs brown, lighter in color.

Pronotum moderately convex, coarsely pitted, somewhat ferrugineous, slightly shiny; collar very distinct, elevated, biseriate; paranota indicated by a slight ridge, a little wider in front at constriction behind collar; median carina distinct, lateral carinae not distinct in male, faintly indicated in female, Elytra constricted before apex, distinctly longer than abdomen; costal area uniseriate, the areolae small; subcostal area biseriate, the areolae larger; discoidal area long, narrowed at both ends, widest near middle, there six areolae deep; sutural area more widely areolate, light brown in color. Wings smoky, distinctly longer than abdomen.

Length, 3.50 mm.; width, 1.10 mm.

Type (male) allotype (female), Redlynch, New Greensland, Australia, Sept. 20, 1938, in Drake collection.

The uniseriate costal area and indistinct or annihilated lateral carinae separate it from allied members of the genus.

Bunotingis, n. gen.

Antennae moderately stout; segments I and II short, stout; III longest, slenderest; IV moderately long, fusiform. Bucculae broad, areolate, closed in front. Rostrum moderately long; laminae subparallel, open behind. Orifice present. Hypocostal ridge uniseriate. Veins and veinlets moderately thick. Elytra extending considerably beyond apex of abdomen, divided into the usual areas, the discoidal area large. Wing present, longer than abdomen. Pronotum moderately convex, coarsely pitted, tricarinate, subtruncate in front; hood broad, very long, sub-cylindrical, sack-like, not projecting in front, its crest above disc of pronotum; lateral carinal long, extending along sides of hood to the calli, constricted behind disc; median carina extending from hind margin of hood (disc of pronotum) to apex of triangular process. Paranota moderately wide, areolate, completely reflexed, resting on the pronotum.

Generotype, *Cystoechila camelina* Hacker.

This genus may be separated from *Cystoechila*, *Monanthia* and *Physa-tocheila* by the long, peculiar hood and the long lateral carinae extending along each side of the hood as far forward as the calli. In *Aulotingis* Drake and Poor the hood is much longer and differently formed, and the paranota is absent.

Onymochila, n. gen.

Broad, stout setose. Antennae short, setose; segment I shorter, longer and stouter than II; III longest, slenderest; IV fusiform. Rostral laminae thick, slightly divergent posteriorly, open behind, setose, the rostrum long. Orifice present. Hypocostal ridge areolate. Bucculae contiguous in front. Legs short, setose. Pronotum tricarinate, carinae long, thick, raised; lateral carinae very long, extending anteriorly to the antero-lateral margins of triangular process; median carina profound, extending entire length of pronotum; hood indistinct, represented by a slightly raised area in front, the front margin of pronotum with one row of areolae; paranota completely reflexed, resting on dorsal surface of pronotum, not covering lateral carinae. Elytra a little longer than abdomen, divided into the usual areas, the discoidal area large.

Generotype, *Cystoechila dichopatali* Horvath.

Separated from *Cysteochila* Stal by the very long lateral carinae, which are slightly divergent anteriorly and extend forward to the front margin of collar. The appendages are also distinctly setose. *O. dichopatali* causes extensive gall formations in the leaves *Dichopetalum cymosum* in South Africa. Horrath, ANN. MAG. NAT. HIST, SER. 10, VOL. III, 1929, p. 324, suggested that this gall-forming tingid might represent a new genus.

***Habrochila africana*, n. sp.**

Moderately large, the nervures dark brown to dark fuscous and sparsely hairy, the areolae clear. Pronotum impunctate, fuscous, somewhat shiny; paranota large, reflexed, longer than wide, with three elongate areolae behind and usually three much smaller ones in front, there two areolae deep; hood moderately large, rather narrow, about one and a half times as long as high; median carina very short, less than half as high as hood, composed of one areola; tumid elevation behind much higher and twice as long as hood, inflated, distinctly compressed laterally behind.

Antennae testaceous, moderately hairy, the terminal segment black; segment I long, slightly more than three times the length of II; III scarcely more than twice as long as IV. Legs long, slender, testaceous, the tarsi black. Fostrum reaching on metasternum, the laminae obsolete. Elytra elongate, narrowed at base, the inflated area moderately large; costal area uniseriate, the tumid area moderately large, moderately high, situated just in front of middle of elytra.

Length, 3.50 mm.; width, 1.50 mm.

Type male, Kampal, Uganda, April 27, 1934, on *lantana*, H. Hargreaves; allotype (female) and several paratypes, same data as type; 1 paratype, in the region of South Andrahomana, Madagascar; several paratypes, Nairobi, Kenya Colony, May 1934; elevation 545 feet, A. F. J. Godge, 4 paratypes, Meenen, Natal, Nov. 1929, H. P. Thomasset; 2 specimens, Pretoria. This species may be separated from its congeners by the unicarinata pronotum. The color of the bulla of elytra is somewhat variable but is dark-fuscous in most examples. Type in British Museum.

***Baeotingis silvestrii*, n. sp.**

Small, the veins testaceous, marked with brown or fuscous. Head brown, convex above, with five long, slender, testaceous spines; median spine porrect, longer than frontal pair; hind pair appressed, nearly reaching base of antennae. Bucculae meeting in front, areolate. Rostrum testaceous, dark brown at apex, extending to middle of mesosternum; lamina rather low, pale testaceous, areolate, open behind. Legs slender, yellowish brown, the apices of femora and tarsi dark brown to fuscous. Body beneath black, shiny.

Antennae moderately long, smooth, testaceous, the basal two and apical segments dark fuscous; segment I stout, moderately long, more than three times as long and stouter than II, the latter short; III long, slender, straight, three and one-half times as long as IV; IV hairy, slightly thickened, subequal to I in length. Pronotum black-fuscous, coarsely pitted, brown to testaceous behind, tricarinate; lateral carinae distinctly raised and divergent anteriorly, concave within in front; median carina uniseriate, gradually raised anteriorly, lower than hood in front; hood

small, inflated, slightly projecting in front, about twice as long as high. Paranota moderately wide, a little wider opposite humeri, moderately reflexed, biseriate, the outer margins rounded, the areolae moderately large, Elytra narrowed apically, terminating behind in an obtuse angle (brachypterous), widest in front of middle, the areolae (also of paranota, hood and carinae) clear; costal area moderately wide, biseriate, the outer row of areolae tending to be a little smaller, the veins considerably embrowned; subcostal area wider, mostly biseriate, triseriate in widest part; discoidal area long, about two-thirds as long as elytra, narrowed at both ends, triseriate behind, the vein separating it from subcostal and costal areas (including a few veinlets in latter) dark fuscous; spot on outer boundary (beyond middle) of discoidal area dark brown or fuscous. Front margins of hood and paranota with long, pale, fine hairs; veinlets of reticulations with a few long, very fine, erect hairs.

Length, 2.50 mm.; width, 1.20 mm. The female is a little larger than the male.

Type (male) and allotype (female), one paratype and two last instar nymphs, Rio Santa Cruz, Patagonia, Argentina, collected by Dr. F. Silvestri, after whom the insect is named. Type in Budapest Museum.

This species is very distinct from *B. oglobini* Drake and slightly modifies the generic description. The marginal spines of elytra, and the fine, erect, bristly spines of veins separating areas of elytra are wanting; the paranota is also much narrower. In the last nymphal instar, the posterior angles of pronotum, margins of abdomen are armed with long, erect dark-fuscous spines. There are also a pair of similar spines on pronotum, a pair on mesonotum and two on median longitudinal line beyond middle of abdomen. The color is pale testaceous with margins of pronotum, wing pads and abdomen dark brown. The median cephalic spine is very long, much longer than frontal pair; the hind pair are absent.

Oncophysa leai, n. sp.

Head brown to dark fuscous, with two, short, porrect, frontal spines, the hind pair short, appressed, the median wanting. Antennae long, slender, indistinctly pilose, yellowish brown, the terminal segment largely dark fuscous; segment I short, swollen, moniliform, thicker and about twice as long as II; III very long, very slender, straight, four times as long as IV; IV rather short, hairy, slightly enlarged apically. Rostrum testaceous, black at tip, reaching nearly to the middle of mesosternum; laminae parallel, whitish, uniseriate, open behind. Legs moderately long, moderately stout, brownish. Eyes transverse, reddish to dark fuscous.

Pronotum strongly convex, coarsely pitted, tricarinate, truncate in front; collar raised, forming a low flat hood-like structure, areolate; paranota large, resting on upper surface of pronotum, covering lateral carinae on disc and in front, not touching median carinae, forming a large, high, cylindrical vesicle over each humeral angle, the vesicles dark fuscous much higher than in *O. vesiculosa* Stal, leaning slightly outwards; median carina uniseriate, the dorsal nervure from centre of disc posteriorly strongly widened; lateral carinae concealed on disc by the large vesicles, behind also greatly widened; hind triangular process long, triangular, areolate. Elytra completely overlapping behind in repose, costal area

narrow, uniserate reflexed against subcosta; subcostal area triseriate, wide; discoidal area large, narrowed at both ends, with outer boundary sinuate, widest at middle, there five areolae deep, sutural area large, the areolae clear.

Length, 4.40 mm.; width, 1.40 mm.

Type (female), allotype (male), 3 paratypes, Geraldton & Mullewa, Australia, collected by W. A. Lea, in Budapest Museum.

The brown or yellowish brown color and extremely high, cylindrical vesicles of paranota separate this species from *O. vesiculosa* Stal and its varieties described by Hacker. The vesicles in the latter are not cylindrical and scarcely one-third as high.

Galeatus clara, n. sp.

Head brown, with five, long slender, black, porrect spines, the hind pair longest. Eyes black, moderately large. Antennae testaceous, moderately long, pilose; segment I thicker and twice as long as II; III two and one-half times as long as three; IV moderately long, slightly enlarged and darkened apically. Legs long, slender, testaceous, the tips of tarsi black. Bucculae widened posteriorly, testaceous, open in front. Rostrum yellowish brown, extending to metasternum; laninae areolate, closed behind. Body beneath brown, the sternum somewhat ferrugineous.

Pronotum black-fuscous, pitted, moderately convex; hood narrow, high, with two large areolae on each side; paranota broad, moderately reflexed, with five large clear areolae in each side; lateral carinae large, shell-like, infusate, considerably higher than hood; median carina foliaceous, moderately elevated, clear; hind process inflated, nearly as high as lateral carinae, infusate behind. Elytra with large clear areolae; costal area broad, with large, transverse rectangular areolae; postero-lateral apex of discoidal area raised so as to form a small tumid elevation; subcostal area almost entirely uniseriate; discoidal area short, uniseriate; sutural area biseriate, the inner row of areolae large.

Length, 3.15 mm.; width, 1.80 mm.

Type, macropterous male, Shanghai, China, Drake collection.

This species differs from *G. peckhami* Ashmead and *G. spinifrons* Fallen by its much smaller size, shorter cephalic spines, much smaller lateral carinae and much smaller and much shorter inflation behind.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE GREEN-WINGED TEAL OF THE ALEUTIAN
ISLANDS

BY HÉRBERT FRIEDMANN*

The green-winged teal breeding in the Aleutian Islands, east to Akutan, have long been recognized as being similar to the Old World *crecca* and not to the New World *carolinense* and are listed as *crecca* in all current works. However, a careful comparison of extensive series of Alaskan and Old World (European and Asiatic) *crecca* reveals that the birds of the Aleutians are sufficiently distinct from those of Europe and Asia to warrant nomenclatural recognition. The population inhabiting the Aleutian Islands may be designated as

Anas crecca nimia subsp. nov.

Type: U. S. Nat. Mus. (Biol. Surv. Coll.) no. 366381, ad. ♂, collected on Kiska Island, Alaska, June 4, 1937, by O. J. Murie (orig. no. 3664).

Subspecific characters: similar in coloration to typical *crecca* of Europe and Asia, but larger, especially in the male, the wings in that sex averaging 193.1 mm. as opposed to 178.7 mm. in typical *crecca*, the wings of the females averaging 186.7 mm. as opposed to 174.2 mm. in *crecca*.

Measurements of type: wing 192, tail worn; exposed culmen 35.1, tarsus 32.1; middle toe without claw 34.2 mm.

The dimensions of 13 adult ♂ *nimia* are as follows: wing 182-204 (193.1); tail 65.1-76 (71.0); exposed culmen 33.2-37.4 (35.8); tarsus 29.2-34.1 (31.4); middle toe without claw 33.1-39.1 (35.7 mm.).

Range: The Aleutian Islands, east to Akutan.

Of typical *crecca* those birds geographically nearest to *nimia* are the ones from Kamchatka and Bering Island. Three such males present the following dimensions: wing 177-182 (179.3); tail 62.1-66.5 (63.7); exposed culmen 35.1-38.1 (36.8); tarsus 28.5-30.2 (29.6); middle toe without claw 32.2-33.2 (32.8 mm.). Agreeing with these are 22 males from China, Japan, and Korea, with the following: wing 174-187 (179.5); tail 62.1-70.9 (65.3); exposed culmen 29.3-38.1 (35.6); tarsus 28.1-31.1 (29.9); middle toe without claw 31.1-36.4 (33.0 mm.); and 3 from Europe—wing 175-182 (178); tail 61.4-64.7 (63.0); exposed culmen 36.2-37.9 (37.1); tarsus 30.1-35.4 (31.9); middle toe without claw 32.2-34.2 (33.2 mm.).

The dimensions of the females show less striking differences, but support the characters shown by the males.

3 ♀ *nimia*: wing 185-189 (186.7); tail 65.6-66.6 (66.1); exposed culmen 34.2-36.1 (35.1); tarsus 30.4-31.2 (30.9); middle toe without claw 33.1-34.1 (33.8 mm.).

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4 ♀ *crecca* from eastern Siberia: wing 166-173 (172.0); tail 60-61.1 (60.6); exposed culmen 31.3-37.1 (34.2); tarsus 28.1-32.1 (29.4); middle toe without claw 30.2-34.1 (32.8 mm.).

17 ♀ *crecca* from Japan, China, Burma, and Siam: wing 167-182 (174.1); tail 60.2-65.1 (62.6); exposed culmen 33.0-35.4 (34.0); tarsus 27.2-30.1 (28.6); middle toe without claw 28.1-34.1 (31.9 mm.).

5 ♀ *crecca* from Europe: wing 167-184 (176.4); tail 58.3-66.0 (61.9); exposed culmen 33.7-36.5 (35.5); tarsus 28.1-31.1 (29.3); middle toe without claw 30.2-34.6 (32.3 mm.).*

Apparently *A. c. nimia* is quite restricted to the Aleutian chain, as three birds from St. Paul Island, in the Pribilofs, are *A. c. crecca*. The scattered records of largely "accidental" wanderers of *crecca* from Labrador, Nova Scotia, Maine, Massachusetts, Connecticut, Ohio, New York, New Jersey, Virginia, and the two Carolinas are apparently referable to typical *crecca*. I have examined two such birds from Labrador and New York, and they (both males) are *crecca* and not *nimia* in their dimensions.

A downy young *nimia* from Oogliugu Island is similar to comparable examples of *carolinense*.

It follows, then, that in North America we have in all three forms of the green-winged teal, with the following ranges.

Anas crecca crecca: an Old World form that occurs in the Pribilof Islands, and as a casual or accidental wanderer, in Labrador, Nova Scotia, Maine, Massachusetts, Connecticut, Ohio, New York, New Jersey, Virginia, North Carolina, and South Carolina.

Anas crecca nimia: resident (apparently) in the Aleutian Islands, east to Akutan; no migrant or wintering individuals known as yet.*

Anas crecca carolinense: breeds from north-central Alaska, northern Mackenzie, and southern Ungava, south to central California, northern New Mexico, Nebraska, southern Ontario, western New York, and Quebec, and wintering southward to Central America, the Gulf States, and (rarely) the West Indies.

*For assistance in measuring the birds examined I am indebted to Father Antonio Olivares, a young Colombian priest who is spending part of his time in this country studying birds in the U. S. National Museum.

**There is an old record, of Langsdorff's, from Sitka, Alaska, published by Schalow (Journ. f. Ornith., 1891, p. 267) as *crecca*. It is not clear that this identification (as opposed to *carolinense*) was critically made, and it is obviously not feasible to attempt to place it definitely with either *crecca* or *nimia* in the present understanding of these races.

Bent (Bull. 126 U. S. Nat. Mus., 1923, 102) writes of these birds (under the name *crecca*), "... apparently resident in the Aleutian Islands or migrating westward into Asia . . .", but I have seen no east Asiatic examples that could be called *nimia*.

PROCEEDINGS
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ANOTHER NEW ANOLE FROM SOUTH FLORIDA

HOBART M. SMITH¹ AND ROBERT H. McCAULEY, JR.²

While attending scientific meetings in Miami, Florida, the junior author walked briefly during the afternoon of November 6, 1946, along Brickell Avenue south of the business section of the city. In Brickell Park, located east of Brickell Avenue and just south of the Miami River, an unusual and unknown *Anolis* was found. Numerous individuals were seen in the park, which is landscaped with many kinds of tropical trees and shrubs, and in the immediately surrounding area. As time was limited for herpetological reconnaissance the extent of this population was not determined, but these lizards were seen two blocks south of the park along Brickell Avenue and one block west across this street from the park.

Most specimens were observed on trees or shrubs. Occasional individuals, first noted on the ground near the base of a tree, when frightened immediately scurried to the trunk. Some were resting near the ground on the sunny sides of trunks of coconut palms or on telephone poles. Others were discovered at least thirty feet above the ground in the branches of a tree where they could be seen from the south approach of the Brickell Avenue bridge.

This lizard is extremely agile and so alert and quick that it readily eludes the hand. Large specimens were especially difficult to catch. It is particularly adept at dodging around trunks and branches in order to hide in some hole or crevice or to climb out of reach. Ten or twelve specimens living on a banyan tree (*Ficus* sp.) were especially secure from the herpetologist as they took refuge among the many secondary trunks and aerial roots. Over a hundred specimens of this *Anolis* were seen but only six were captured and preserved.

They prove to belong to the species *distichus*, readily recognizable by the median groove on the top of the snout, separating two juxtaposed rows of subrectangular scales from each other. They are, furthermore, very much like *d. distichus* of the Bahamas. Coloration, habitus and virtually all scale characters appear to be essentially the same as in that race. However, an attempt to determine if possible from which of the several Bahaman Islands the lizards may have been imported revealed the existence of several distinctions—even though minor—between the Miami population and the Bahaman ones. The former could be matched with none examined from the islands, although specimens were seen from

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every island from which the species is known. It seems virtually certain the Miami population is an importation from some Bahaman Island, probably New Providence since that is the one most commonly visited. Yet it is almost equally certain (we hold some reservation, on account of the small series at hand) that the Miami population has differentiated sufficiently to be regarded as a distinct geographic race. If further specimens bear out its distinctness, it will be of great interest to determine, if possible, the date of importation of this population, as it will give a clue to the rapidity with which geographic races may differentiate at least in anoles. Degerbøl (see Hall, *Journ. Mamm.*, 23:100, 1942) has already indicated that island races—and the present instance may be considered comparable even though an island is not involved—may differentiate, among mammals at least, in as little time as 30 years. It appears that reptiles may do likewise.

The present differentiation finds a parallel in *Anolis stejnegeri*, a Floridian form—probably also a recent import, within a century or two—of the widely-distributed West Indian species *sagrei*. *A. stejnegeri*, much like the Miami race of *distichus*, differs from its nearest relative in very few characters—chief among which, in *A. stejnegeri*, is its dewlap color. The Miami *distichus* differs from its nearest relative, apparently, in three characters, but none are as obvious as dewlap color.

***Anolis distichus floridanus* subsp. nov.**

Holotype. U. S. Nat. Mus. No. 127114, adult male, secured in Brickell Park, Miami, Florida, by Robert H. McCauley, Jr., on November 6, 1946. *Paratypes*. Five. Univ. Ill. Mus. Nat. Hist. Nos. 410-411, Carnegie Museum No. 28217, Museum of Comparative Zoology No. 50001, and Chicago Natural History Museum No. 55502, same data (except for sex) as holotype.

Diagnosis. A member of the *distichus* complex, closely related to *d. distichus*, having a pale yellow dewlap; a middorsal longitudinal groove on the snout bordered on either side by a row of subrectangular scales; very small, granular dorsal and lateral scales; smooth ventral scales; an occipital scale about the size of (although a little shorter than) the external ear opening; 4 to 5 rows of loreals; a group of 5-8 (generally 6) enlarged supraoculars; supraorbital semicircles generally separated from occipital; and head scales somewhat rugose particularly on snout.

Different from *d. distichus* in always (as opposed to 19%) having the two supraorbital semicircles completely separated from each other on the middorsal line, in generally (67% as opposed to 15%) having 2 or more scales separating the prefrontal from the anterior superciliary, and in the extensive pigmentation of the throat and chest.

Description of holotype. Head scales slightly rugose, especially on top of snout and in supraocular area, smooth elsewhere; frontal ridges feebly developed, u-shaped; lores sloping; canthal ridge sharp; a distinct, nearly straight, longitudinal middorsal groove extending from rostral to level of posterior canthal, bordered on either side by a row of fairly large, subrectangular scales; 6 scales from rostral to prefrontal, on either side; a minimum of four scales across snout between posterior canthals; 7 small scales in a group in the median prefrontal area; a good-sized preoccipital, more than half size of occipital; 3 small scales preceding the preoccipital, in contact with the median prefrontal group,

entirely separating supraorbital semicircles from each other; rear scales of supraorbital semicircles larger than median scales; occipital completely separated from supraorbital semicircles; occipital shorter than most of ear-opening, but of about equal area; 6 small enlarged supraoculars, irregular in size and shape; 2 scales on each side between prefrontal and anterior superciliary; 4 canthals on either side; 4 rows of loreals; subocular series broadly in contact with supralabials; 5 supralabials and 5 infralabials to a point below middle of eye; a series of chinshields, the anterior 4 in contact with the 2 anterior infralabials, gradually merging with small throat scales; 4 rows of small scales bordering mental between anterior chinshields; gular fan very small.

Dorsal and lateral scales subequal, granular, mucronate, protuberant; ventral scales smooth, much larger than dorsals. Dorsal limb scales subequal in size to dorsal body scales, smaller toward rear of thigh, larger toward front of thigh; scales at base of tail keeled. Tail largely regenerated (see *Variation* for description of a complete tail). A pair of very slightly enlarged postanals.

Dorsal color more or less uniform, very dark brown, lighter when skin is dry; a few dark bars on forelegs. Ventral surfaces of body, limbs and tail rather closely pigmented, especially at sides of gular fan; scales on fan itself pigmented.

Snout to vent, 45 mm.; snout to anterior margin of ear, 11 mm.; snout to occiput, 10 mm.; hind leg from groin, 33 mm.; tibia 10.2 mm.

Variation. Tail in a perfect specimen with poorly defined whorls, about every 8th to 10th vertical row straighter than others, but its scales not enlarged; 5 dorsal crest scales per verticil, 3 ventral scales; small lateral scales about $\frac{1}{2}$ size of crest scales.

In the 5 paratypes, the scales from rostral to prefrontal vary from 5 to 8 (5, five; 6, three; 7, one; 8, one); small scales in prefrontal area 5 to 9 (5, two; 6, one; 7, one; 9, one); a large preoccipital in 2; small scales in front of occipital 2 to 7 (2, one; 5, one; 6, two; 7, one); enlarged supraoculars 5 to 8 (5, one; 6, five; 7, two; 8, two); scales between prefrontal and anterior superciliary 1 to 3 (1, four; 2, five; 3, one); loreal rows 4 or 5 (4, nine; 5, one); chinshields in contact with infralabials 3 to 5 (3, four; 4, four; 5, two); infralabials in contact with chinshields 2 to 3 (2, six; 3, four); scales between anterior chinshields in contact with mental 4 or 5 (4, four; 5, one). Scutellation otherwise as in the type. Coloration much the same, except that the ventral pigmentation is less intense in smaller specimens.

Tail a little longer than body, as follows: snout to vent, 40 mm., tail 55 mm.; 44, 52 mm.; 36, 49 mm.; 37.5, 44 mm.; 38, 50 mm., respectively.

Comparisons. Seven races of *distichus* are recognized at the present time: *distichus*, *distichoides*, *dominicensis*, *caudalis*, *wetmorei*, *altavensis* and *juliae*. *A. d. distichoides* has a red dewlap, the present race a yellow one; the others are all Hispaniolan races, well distinguished by scutellation of the tail and head (Cochran, Bull. U. S. Nat. Mus., 177: 141-159, 1941). Obviously the closest relative of *d. floridanus* is *d. distichus*, widely distributed in the Bahama Islands, and with a type locality on New Providence Island. Specimens of *d. distichus* have been examined from the following islands: Cat (4), Eleuthera (23), Long (42), New Providence (8), Rum Cay (1), and Watling (30). They have been

recorded from no others (the form on Andros Island is *A. d. distichoides*).

From all these specimens the Miami series differs especially in the complete separation of all scales of one supraorbital semicircle from those of the other. No series of significant size approaches closer the figure obtained in the Miami series (100%) than that from the type locality of *d. distichus* (38%); the next largest is the Watling series (24%), while others are less than the average. Almost as clearly distinct is the number of scales between the prefrontals and anterior superciliary, 67% of the Miami series having 2 or more, while in the entire Bahaman series this condition occurs in 15%. The closest significant approach to the Miami series is 18%, in the Long Island specimens; in the series from the type locality the occurrence is 31%. Equally distinctive is the extensive dark pigmentation of the throat, chest and sides of belly in *A. d. floridanus*; in other specimens the venter is nearly completely unpigmented. Males of the new race are heavily pigmented over the entire ventral surface.

The Miami specimens likewise seem distinct in the very small size of the scales on the thigh, in the reduction of the caudal crest scales, and in the protuberance of the dorsal body scales and of certain hind leg scales. These apparent differences are so obviously difficult to evaluate, and so clearly dependent upon state of preservation that their significance is doubtful. No other differences are apparent in coloration, in scutellation of the tail, head and limbs, or in proportions.

The New Providence Island series is not sufficiently large (8) to serve for very reliable conclusions, at least based upon border-line percentages, although the Florida series (6) is even smaller. Nevertheless an indication exists that the origin of the Florida population probably was New Providence Island, inasmuch as the sample from the latter locality more closely approaches the characters of the Miami series than any other population. The island is suggested as a probable source also by the fact that there is a much greater frequency of intercourse between it and Miami than between any other Bahaman island and Florida.

The species is readily distinguished from *carolinensis* and *stejnegeri*, the only others previously known from this country, by the smooth ventral scales; they are strongly keeled in the others. Another name, *Anolis cooperi* Baird (Proc. Acad. Nat. Sci. Phila., 1858: 254) may well belong to some Florida species (see Barbour, Copeia 1931:87), but it is not this. The type is said to have "a few central dorsal rows of scales abruptly larger than the rest," while in all three species now definitely known from the United States the dorsal scales are uniform in size.

Remarks. As observed in life, this is a short-headed, short-bodied, short-tailed *Anolis* with rather long legs. It has a flattened appearance and at first glance is slightly reminiscent of *Hemidactylus turcicus*. The general coloration is changeable from pale gray to very dark brown. The back is marked with four poorly defined dark brown or black chevrons which point posteriorly. Both chevrons and interspaces are flecked with the opposite color, causing the pattern to be somewhat obscured. The top of the head is strikingly marked with a straight dark line across the crown and supraorbital regions. Two other similar lines diverge from the postparietal region to the posterior corner of each eye. The effect is a backward pointing triangle of dark lines upon the head. The tail,

slightly compressed, is banded with dark and light at least in the darker color phases. The extremity of the tail is nearly black with the extreme tip light buff. The legs are banded much like the tail. The venter is unmarked and is dark or light according to the color stage. The throat fan is small and is immaculate pale yellow in color. The undersides of the hind legs and tail are similarly colored though lighter.

Several males were seen displaying their throat fans and bobbing their heads in a manner resembling that of *Anolis carolinensis*.

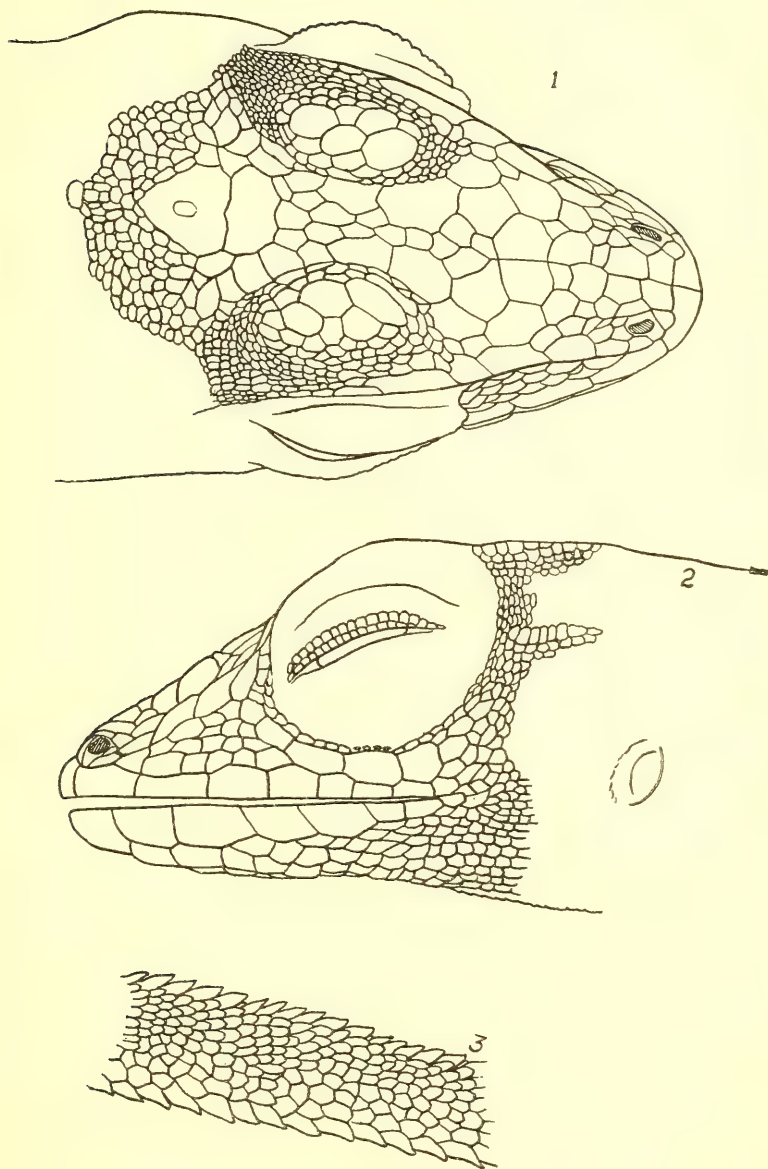
The general color of each lizard closely matched the background on which it rested. Those on trunks of coconut palms were very light; those on rough bark were mottled heavily, while those on creosoted telephon poles were very dark brown. This camouflage was contrary to the habit of *Anolis carolinensis* which is frequently a conspicuous bright green when resting on a pale gray tree trunk.

We are much indebted to Mr. Arthur Loveridge, Dr. Doris Cochran and Mr. Clifford Pope for their courtesy in providing comparative material from the extensive collections under their care.

Fig. 1. Dorsal view of the head of a paratype of *Anolis distichus floridanus*, Univ. Ill. No. 410.

Fig. 2. Lateral view of head of same.

Fig. 3. Lateral view of tail of same. All drawings by Mrs. Katherine H. Paul, staff artist for the Department of Zoology, University of Illinois.



PROCEEDINGS
OF THE
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A NEW *CONTOPUS* (*BLACICUS*) FROM THE CAYS OF
SOUTHERN CUBA

T. D. BURLEIGH AND A. J. DUVAL

While making a survey of the birds of Cuba, it was noticed, even in the field, that the pewees inhabiting the mangrove (*Rhizophorus*) swamps of the cays off the southern coast of Cuba were obviously different from those taken on the mainland away from the mangroves. The cay birds here separated from the nominate race may be known as

*Contopus caribaeus morenoi*¹ subsp. nov.

Type.—Adult male, #395059, U. S. National Museum (Fish and Wildlife Service collection); Cayo del Rosario, Cuba, March 21, 1948, T. D. Burleigh and A. J. Duvall, original number 290.

Subspecific characters.—Similar to *Contopus caribaeus caribaeus* of the mainland of Cuba but darker on the dorsal surface and lacking the marked yellowish tone of the ventral surface.

Geographic distribution.—As far as now known, resident and confined to the mangrove swamps of the cays off the south coast of Cuba, and at the entrance to the Zapata Swamp at the mouth of the Rio Hatiguanico.

Specimens examined.—Cayo del Rosario, (3) March 21, 1948; Cayo Cantiles, (1) September 20, 1930; Doce Leguas (Cayo Rosalia), (2) September 7, 1930; Doce Leguas (Cabeza del Este), (2) September 6, and September 7, 1930; Doce Leguas (Cayo Ancitos), (1) September 9, 1930; Doce Leguas (Grand Cay), (1) September 9, 1930; and mouth of Rio Hatiguanico (entrance Zapata Swamp), (2) March 18, 1938.

Remarks.—Specimens of *morenoi* in March are very gray on the lower surface and lack almost completely the buff or yellow of typical *caribaeus*. On the upper surface they are grayish (not olivaceous) and give a decidedly blackish appearance. In fresh fall plumage, the new form exhibits some buff on the ventral surface but it is not nearly as buffy as the birds in comparable plumage from the mainland of Cuba. Especially noticeable is the whitish chin and throat which, in all specimens examined of typical *caribaeus*, is buffy. On the dorsal surface, the difference is not as marked in fall examples as in the spring ones, but *morenoi* is invariably grayish rather than olivaceous. No significant size difference was found.

This new form, as far as known, is confined almost entirely to the mangroves along the water courses dissecting the cays off the southern coast of Cuba. The only indication that it occurs on the mainland is afforded by the two specimens taken in mangroves at the entrance to

¹Named for Dr. Abelardo Moreno, one of Cuba's eminent scientists, who is contributing so materially today to the knowledge of bird life in Cuba.

the famed Zapata Swamp at the mouth of the Rio Hatiguanico. They are typical of *morenoi*, while an example from the heart of the Zapata Swamp (Santo Tomas), in the midst of the big timber, is typical *caribaeus*. At Laguna Guanaroca on the east side of Cienfuegos Bay, we took one specimen which is *caribaeus*, agreeing with several examined from the north coast region. In all cases, birds characteristic of *caribaeus* were taken away from the mangroves, indicating that there is a definite ecological, as well as morphological, difference in this new subspecies.

Specimens of *C. c. caribaeus* from western Cuba (Pinar del Rio Province) are identical with those examined from eastern Cuba (Oriente Province), and since D'Orbigny (in La Sagra's Hist. Isla de Cuba, Aves, 1839:77) did not designate a type specimen, we arbitrarily restrict the type locality of the nominate race to the vicinity of Holguin in Oriente Province, Cuba.

In connection with the description of *morenoi*, specimens from the Bahama Islands (*C. c. bahamensis*), Jamaica (*C. c. pallidus*), Hispaniola (*C. c. hispaniolensis*), and Gonava Island (*C. c. tacitus*) were examined. Bond (Birds of the West Indies, 1936:251, footnote) says that the characters ascribed to *tacitus* are not constant enough to be separable from *hispaniolensis*. A comparison of material from Gonava Island with that of Haiti and the Dominican Republic indicates that the characters as given by Wetmore (Proc. Biol. Soc. Wash., 41, 1928:201) are constant and that *tacitus* is a recognizable form.

The supposed main distinguishing features of *Blacicus* from *Contopus* are: shorter wing, larger and broader bill, and longer and more numerous rictal bristles. While it is true that these features do distinguish *Blacicus caribaeus* from *Contopus virens* it was found that *C. cinereus* had wing length as in *caribaeus* and bill like *virens*; that *C. fumigatus* had wing as in *virens* and bill nearer to *caribaeus*; and that *C. lugubris* had larger wing than *virens* but bill as in *caribaeus*. Thus, no characters were found which were sufficiently constant to consider *Blacicus* generically distinct from *Contopus*, and we follow Bond (Field Guide of Birds of the West Indies, 1947:146) in considering *Blacicus* congeneric with *Contopus*.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF CURCULIONIDAE, *PHYLLOBIUS*
INTRUSUS, INJURIOUS IN THE STATE OF
RHODE ISLAND. (COLEOPTERA)

BY DR. HIROMICHI KÔNO
(Sapporo, Japan)

In November 1947 I received from L. L. Buchanan, Division of Insect Identification, U. S. Department of Agriculture, 3 specimens of a *Phyllobius*-species for identification. The species has recently been quite injurious to arborvitae in evergreen nursery plantings in the State of Rhode Island. Mr. Buchanan believed it to be a native either of Japan or of the Asiatic mainland.

This opinion is correct, the species being a native of Honshu, the main island of Japan. It is, however, rather rare in Japan, and seems to be undescribed.

Phyllobius intrusus, new species

Black; antennae reddish brown, legs reddish brown to black, abdomen sometimes more or less reddish. Body and elytra clothed with metallic green scales and fine short hairs. Metasternum in the middle nearly naked. Abdomen for the greater part and legs with very little clothing.

Body elongate. Head broader than long, parallel at the sides, without a swelling of the surface behind the eyes. Eyes rather distinctly prominent. Rostrum short, nearly as long as broad, feebly narrowed at middle, with a nearly bare area toward the apex above. Antennae rather stout. Scape strongly curved, in the male scarcely surpassing the front margin of the prothorax, in the female shorter. Funicle a little longer than scape, joint 2 scarcely shorter than 1, 3 a little shorter than 2, the fourth and fifth each as long as broad. Club moderately stout, at least as long as the fifth to seventh funicular joints combined. Prothorax broader than long, narrower than the elytra, rounded at the sides, obviously narrower in front than at the base, above with a subcarinate median line. Elytra rather long, with regular series of punctures, the sides nearly parallel. Metasternum in the middle shiny. Abdomen finely punctate and very finely rugulose. In the male the first abdominal sternite feebly depressed in the middle, the second and third sternites each with a transverse wrinkle or fold near posterior margin, apical sternite flattened or somewhat depressed longitudinally along the middle. Legs stout. Femora thick, each with an acute tooth. Tibiae somewhat flattened, with both the outer and the inner edges carinate, and somewhat cut away on the inner face of

their lower half. Tarsi stout and short, the first segment not longer than the following two combined, the third broad.

Length 5.5-6 mm (excluding rostrum). Breadth 2 mm.

Holotype: ♂, Newport, Rhode Island, June 2, 1947, A. L. Angel.

Allotype: ♀, Newport, Rhode Island, June 2, 1947, A. L. Angel.

Paratypes: ♀, Kyoto, Japan, May 10, 1924, K. Takeuchi; ♂, Kyoto, Japan, May 21, 1930, K. Takeuchi; ♂, Utsunomiya, Japan, July 5, 1929, M. Nakamura; ♀, Tokyo, Japan, June 9, 1932, Dr. H. Furukawa; ♂, Newport, Rhode Island, June 2, 1947, A. L. Angel.

Holotype and 2 paratypes preserved in United States National Museum. Allotype and 3 paratypes are in my collection.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTWO NEW SUBSPECIES OF BIRDS FROM BONAIRE
ISLAND

BY WILLIAM H. PHELPS AND WILLIAM H. PHELPS, JR.

A small collection of birds was made on the Island of Bonaire, Dutch West Indies, in November, 1947. Among them are two that appear to be new, and which are described below.*

All specimens listed are in the Phelps Collection, Caracas, unless otherwise indicated. Names of colors are capitalized when direct comparison was made with Ridgway's "Color Standards and Color Nomenclature."

Margarops fuscatus bonairensis, new subspecies

Type: From Fontein, Bonaire Island, Dutch West Indies. No. 40933, Phelps Collection, Caracas, Venezuela. Adult male collected November 27, 1947, by William H. Phelps, Jr. (Type on deposit at the American Museum of Natural History.)

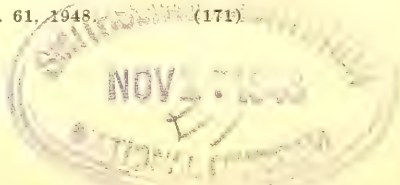
Diagnosis: Differs from the subspecies *M. f. fuscatus* and *M. f. densirostris*, from the Greater and Lesser Antilles, in that the brown markings are more grayish olive, both above and below.

Range: Known only from Bonaire Island.

Description of Type: Head (except the throat and lores), back and uropygium approximating Bister, the edges of the feathers near to Drab-Gray, except the upper tail-coverts which are edged with white; lores dark brown. Below white, the feathers marked with paler Bister (excepting on center of abdomen) in the form of streaks on the throat and scallops on the breast, sides, flanks and under tail-coverts, more densely marked on the breast. Remiges Fuscous, more brownish on the tertials, border externally with grayish and the tertials with light brown; the secondaries and tertials tipped with white, more broadly on the tertails; inner vanes of remiges, on the basal part, lightly edged with buffy; the interior tertials indistinctly barred with dusky; greater upper wing-coverts uniform with primaries, the lesser ones uniform with back; under wing-coverts and axillaries uniform with sides. Tail Fuscous above, grayish below, the rectrices narrowly edged with whitish, with white tips, the white areas increasing towards the external feathers and most extensively on the inner vanes.

Bill (in life) "brownish-flesh"; feet "brown"; iris "ivory." Wing, 136 mm.; tail, 107; exposed culmen, 28; culmen from base, 35; tarsus, 35.

*We wish to express our thanks to our friends Hon. F. N. Craandijk, Netherlands Minister to Venezuela, and Hon. X. M. C. H. Krugers, Governor of Bonaire, whose kindness and interest made the collection possible; and to Sr. Bernardo Flores, Venezuelan Consul in Bonaire, and Mr. L. C. Gerharts who also contributed to its success.



Remarks: Sexes alike. Size similar to *fuscatus*. Range of measurements: five adult males—wing, 135-139 (136.6) mm.; tail, 107-114 (110.6); culmen from base, 33-35 (34.2); one adult female—wing, 136; tail, 109; culmen from base, 34. Measurements of *fuscatus* from Puerto Rico and St. Thomas: five adult males—wing, 138-142 (139.6); tail, 110-115 (112.6); culmen from base, 31-33 (32); five adult females—wing, 132-142 (137.8); tail, 108-112 (110); culmen from base, 30-32 (31.2).

The plumages are fresh and without blood sheathes or signs of moulting and the gonads are not developed, indicating that the breeding season had not yet arrived.

We found this species only at the Fontein estate among the fruit trees bordering the brook which flows from a spring there. Hartert (1893:327) says that the specimens collected by him were also obtained at Fontein and that he did not observe the species at any other part.

Unfortunately, the only other known specimens from Bonaire, those collected by Hartert, and at present in the American Museum of Natural History, were in such worn plumage as to be useless for subspecific identification and, on that account, they have been called up till now *fuscatus*; they were collected in the month of July. Hellmayr (1934:342) recognized that the subspecific identification was doubtful and says: "A race of doubtful standing occurs on the Leeward Islands (Orquilla, Los Hermanos; Bonaire, Dutch West Indies). Hartert [1893:327; 1902:297] insists that they belong to *fuscatus* rather than *densirostris*, but on reexamination the Bonaire specimens, upon which his remarks were based, prove to be in far too worn plumage to be of any use in deciding their subspecific affinity. Lowe [1909:327] subsequently recorded *Margarops fuscatus* from Orquilla, Los Hermanos, which doubtless pertains to the same undetermined race."

Although Hellmayr (loc. cit.) says that the race which inhabits Horquilla Island, in the Los Hermanos Archipelago, undoubtedly belongs to the undetermined race of Bonaire, this is not positively known because Lowe (1909:328) says, referring to the two males and one female collected there by him, and which he referred to the subspecies *fuscatus*: "My specimens agree in coloration of plumage with typical specimens in the British Museum, but the measurements are rather smaller." Bond (1945:101) considers that the birds of Bonaire as well as those of Los Hermanos are of an undetermined race (Phelps, Jr., 1947:115).

Most of the specimens of *fuscatus* examined have more or less worn plumage but there are five which are in fresh plumage, comparable with ours of *bonairensis*: 1 ♂ September, 2 ♀ November, Barbuda; 1 ♀ July, Antigua; 1 ♂ September, St. Thomas.

Specimens Examined

M. f. fuscatus.¹—ANTIGUA: 3 ♂, 5 ♀. BARBUDA: 3 ♂, 2 ♀. MONA I.: 1 ♂, 1 ♀. ST THOMAS: 2 ♂, 8 ♀, 1 (?). SOMBRERO I.: 1 ♂, 1 (?). PUERTO RICO: 4 ♂, 2 ♀, 1 (?). ST. CROIX: 1 ♀.

M. f. densirostris.¹—ST. LUCIA: 1 ♂, 2 ♀, 1 (?). GUADELOUPE: 3 ♂, 2 ♀, 1 (?). DOMINICA: 2 ♂, 1 ♀, 1 (?).

M. f. bonairensis.—BONAIRE: 13 ♂ (incl. type), 1 ♀, 5 ♂.¹

¹Specimens in American Museum of Natural History.

Vireo altiloquus bonairensis, new subspecies

Type: From Bonaire Island, Dutch West Indies. No. 40913, Phelps Collection, Caracas, Venezuela. Adult male collected November 27, 1947, by William H. Phelps, Jr. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from all subspecies of *V. altiloquus* by a darker and purer gray crown, superciliary stripe purer white without trace of buffy, lores blacker, sides of head grayish olive instead of buff olive, under parts purer white, and submalar stripes blacker; differs from all races of *V. olivaceus* by having submalar streaks.

Range: Known only from the Island of Bonaire.

Description of Type: Forehead and crown darker than Mouse Gray, the crown bordered by dusky streaks; back and uropygium Citrine-Drab; superciliary streak, from bill to neck, grayish white; lores dusky; auricular region brownish olive; malar region grayish olive; a fuscous submalar streak. Below, except the under tail-coverts, white, the sides washed with yellowish olive; tibia grayish olive; under tail-coverts Straw Yellow. Wings Benzo Brown; remiges bordered externally with olivaceous, grayer towards the outer ones, and internally with whitish; upper wing-coverts browner, with grayish edges; under wing-coverts yellowish gray; exillaries pale yellow. Tail, above paler than Olive-Brown, below grayish; edges of outer vanes of rectrices more olivaceous and of inner vanes pale yellowish white.

Maxilla (in life) "horn color"; mandible "gray"; feet "pale blue"; iris "red." Wing, 77 mm.; tail, 56; exposed culmen, 15; culmen from base, 20; tarsus, 20.

Remarks: The sexes are alike in coloration, the female somewhat smaller, especially the bill. Measurement of the female—wing, 75 mm.; tail, 52; exposed culmen, 12.5; culmen from base, 17; tarsus, 19.

The female specimen differs from the type, besides being smaller, in having a whiter superciliary stripe and the back, uropygium and upper surface of tail are brighter, more greenish.

Both specimens were collected among the acacia trees and cactus in the neighborhood of Fontein.

Specimens Examined

V. o. olivaceus.—VENEZUELA: 37 (migrants, various localities).

V. o. vividior.³—VENEZUELA: 165 (various localities).

V. altiloquus bonairensis.—BONAIRE ISLAND: 1 ♂ (type, 1 ♀).

V. a. altiloquus.—VENEZUELA: Raudal Carapo, Río Paragua, 3 (?); Boca de Sina,² 1 ♂; Suapure,² 1 (?). BRITISH GUIANA: Paruima Mission, 1 ♂. COLOMBIA:² Masinga Vieja, Sta. Marta, 1 ♂; Bonda, 1 ♂. SANTO DOMINGO:² 51. PUERTO RICO:² 11. JAMAICA:² 9. NAVASSA I.²; 4 ♂, 1 ♀. ST. THOMAS:² 2 ♂, 2 (?).

V. a. barbadensis.²—DOMINICA: 14. BARDUDA: 2 ♀. ANTIGUA: 6. SANTA LUCIA 2 ♂, 2 ♀. ST. VINCENT: 3 ♂, 1 (?). GUADELOUPE: 2 ♂, 2 ♀, 1 (?). GRENADINES: 1 ♀.

²Specimens in American Museum of Natural History.

³Specimens of all the other races of *olivaceus* (see Zimmer, Am. Mus. Nov., No. 1127, pp. 12-15, June 26, 1941), represented in the American Museum of Natural History, were also examined.

V. a. barbatulus.²—CUBA: 37. BAHAMAS: 4 ♂, 1 ♀. DRY TORTUGAS: 1 ♂. COLOMBIA: Buritaca, Santa Marta, 1 ♂; Bonda, 1 ♂, 2 ♀, 5 (?).

V. a. grandior.²—OLD PROVIDENCE I.: 1 ♂.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW BADGER FROM MEXICO-UNITED STATES
BOUNDARY

BY VIOLA S. SCHANTZ
U. S. Fish and Wildlife Service

Further studies of Mexican badgers reveal a new subspecies of *Taxidea taxus* from the Transition Zone, austral region of north northeast Sonora and southeastern Arizona. This race is a grayer subspecies than *sonoriensis* or *berlandieri* which may be recognized by the following description.

Taxidea taxus apache, subsp. nov.

Type.—No. 20747, skin and skull, U. S. National Museum, young 35880

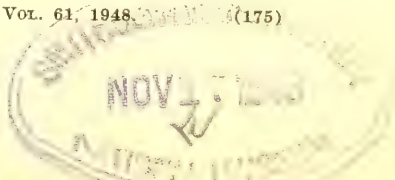
adult female (coronal sutures fused), collected at San Pedro River, Arizona, and Sonora, Mexico-United States boundary line, October 20, 1892, by Capt. Edgar A. Mearns, U. S. Army, and Frank Xavier Holzner, U. S. National Museum. Original No. 2139.

Distribution.—Grassy plains region of southeastern Arizona and north northeastern Sonora, near Mexican-United States boundary, 25 miles south into Sonora, and 65 miles north to Wilcox, Arizona, in the Transition Zone, Apachian biotic province (Dice).

Diagnostic characters.—Body has a more silvery appearance than *sonoriensis* or specimens from the surrounding area; and has a median white line extending from near the nostrils over the dorsal area to the root of the tail.

Color.—Type, summer pelage in process of molting, which apparently seems to start on the face and head and proceeds posteriorly over the dorsal area where it has been replaced with new winter pelage: Face, forehead (except median line) and patches on sides of face in front of ears black as customary in the species; white irregular markings on sides of forehead and cheeks merge with light buffy under parts of throat and neck; ears black fringed with white; general dorsal area is a gray, pinkish buff and black mixture, the hairs at the base are pinkish buff (Ridgway) or moth color (Maerz and Paul), then subapically banded with black and tipped with gray, giving this race a lighter and grayer appearance than *berlandieri* or *sonoriensis*; median white line extends over dorsal area from near nostrils to root of tail; chin brownish; general abdominal area pinkish buff, except for light buff median line; limbs black; under fur of top side of tail cinnamon buff, guard hairs are subapically banded with dark brown and tipped light buff, underside of tail a more predominantly cinnamon-buff.

Skull.—Averages larger than *sonoriensis*, but slightly smaller than *berlandieri*.



Measurements.—*Type*: Total length, 640 mm.; tail vertebrae, 132; hind foot, 104. Skull; Condylbasal length, 116.4; zygomatic breadth, 70.3; mastoidal breadth, 72.5; interorbital breadth, 25; postorbital constriction, 27; palatal constriction, 13.3; palatilar length, 58; maxillary tooth row, 37.7.

Other skin measurements of two females, from 25 miles south of Douglas, Arizona in Sonora, and Wilcox, Arizona, a young adult and an old specimen are respectively as follows: Total length, 570, 695; tail vertebrae, 104, 132; hind foot, 101, 114.

Average and extreme cranial measurements of four females from Fort Lowell, Arizona; Wilcox, Arizona; 25 miles south of Douglas, Arizona, in Sonora; and San Pedro River, Arizona-Sonora Boundary, are as follows: Condylbasal length, 115 (112.7-117.5); zygomatic breadth, 70.7 (69.1-74.4); mastoidal breadth, 69.8 (64.5-76.3); interorbital breadth, 26 (25-26.8); postorbital constriction, 26.8 (26.3-27.6); palatal constriction, 13.2 (13-13.5); palatilar length, 56.6 (55.2-58); maxillary tooth row, 38 (37.6-39.2). Old male: Condylbasal length, 120.6; zygomatic breadth, 75.5; mastoid breadth, 73.2; interorbital breadth, 27.6; postorbital constriction, 29.2; palatal constriction, 14.8; palatilar length, 58.1; maxillary tooth row, 40.8.

Remarks.—*Taxidea taxus apache* appears most closely allied to *T. t. berlandieri*; it has a similar white dorsal stripe reaching from near tip of nose to the tail, but is grayer and slightly smaller. The Wilcox, Arizona specimen shows some intergradation, the white median dorsal stripe does not quite reach to the tail, and this skin is not quite as gray.

The two specimens collected respectively on the San Pedro River Mexican Boundary, and 25 miles south of Douglas, Arizona, in Sonora, within a 25 mile radius, were collected 38 years apart but are very similar in appearance.

One of the collectors of the type specimen, Doctor Mearns was a Surgeon in the U. S. Army serving with the International Boundary Commission while making an International Boundary Survey to re-locate the existing frontier line between the United States and Mexico, west of the Rio Grande River.

Specimens examined.—Total number, 6, as follows:
 Arizona: Apache Pass Draw, Cochise County, 1 (skull only, Mus. Vert. Zool., Univ. California); Fort Lowell, Pima County, 1 (skull only); Wilcox, Cochise County, 2 (1 skin and skull, 1 skull only).
 Mexico Boundary (Sonora-Arizona): San Pedro River, 1 (type locality, skin and skull).
 Sonora: 25 miles south of Douglas, Arizona, 1 (skin and skull, Mus. Nat. Hist., Univ. Kansas).

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW COSTA RICAN SALAMANDERS

BY EDWARD H. TAYLOR

Costa Rica is probably the least known herpetologically of the Central American Republics and much work still needs to be done before an adequate knowledge of the fauna can be had. Consequently it is not surprising that in the large collections made in Costa Rica in 1947 by Richard Clark Taylor and the author several novelties have been discovered. Descriptions of certain of the new forms have already appeared, and other descriptions are being prepared as time permits.

In this paper two salamanders are described, one belonging to the genus *Oedipina*, the other to the genus *Chiropterotriton*.

***Chiropterotriton abscondens* sp. nov.**

Type.—R. C. T. No. 1414. Collected at Isla Bonita (American Cinchona Plantation), elev. 5500 ft., Volcán Poas, Caribbean drainage; Richard C. Taylor, collector, Aug. 1, 1947.

Paratypes.—R. C. T. Nos. 1410, 1411, 1413-1417. Collected by David Allee, Sr. Machado, and Richard C. Taylor.

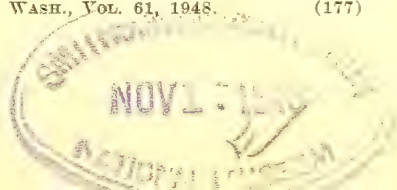
Diagnosis.—A diminutive *Chiropterotriton*, the adpressed limbs separated by $4-4\frac{1}{2}$ costal folds; webbing on hands and feet involves the basal phalanges; nostril small; an arched groove on chin and throat; 14 costal grooves; maxillary teeth 12-16 on each side in males, 19-23 in females; a median palatal perforation between choanae in adults; paravomerine teeth in a single group.

Description of the type.—One of the smallest species of the genus; the snout-to-end-of-vent length, 32.3 mm., tail, 37 mm. Eye large, one and one third to one and one half times length of snout.

Width of an eyelid minutely less than narrowest interorbital width; nostril small, its diameter in distance between nostrils, about eight times; a transverse groove beginning some distance behind eye crosses the throat to opposite side of head; an arched groove or line on throat and chin, the transverse groove forming its base; behind this is the curved gular fold from whose side a lateral nuchal groove passes up on side of neck, first directed backward then forward and meets its fellow on the median nuchal line; posterior parts of eyelids not tucked under a fold; no orbitolabial groove present; a somewhat sinuous groove from eye to lateral nuchal groove; ceratobranchial cartilage forms a ridge or fold that extends above arm nearly to third costal groove.

Vomerine teeth 8-8 on an elevated ridge beginning outside choanae, curving in and back, the series separated by a space equal to that between two teeth, or very slightly more; paravomerine teeth forming a

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single patch, widened and slightly notched behind, separated from the vomerine series by a distance about equal to length of a row of vomerine teeth; choanae small; a median open perforation on the palate, the diameter about equal to that of a choanal opening; a free sublingual fold.

Maxillary and premaxillary teeth total 52 of which six are apparently premaxillary; vomerine teeth 8-8; mandibular teeth total 55; tongue bolitoglossoid. Swelling below nostril on edge of lip almost obsolete; 14 costal grooves, and 12 distinct costal folds, the upper edge of the folds somewhat elevated. A median dorsal groove present; about 28 caudal grooves; cloacal walls with strongly-defined lateral folds; none or only a slight basal caudal constriction; adpressed limbs separated by $4\frac{1}{2}$ to 5 costal folds.

Fingers webbed at base leaving tip of first digit, and one and a half joints of other digits free, the web between deeply excised; toes webbed at base, the tip of first digit and two joints of other digits free of web. Distinct pads under tips of digits.

Skin generally smooth but under a lens the openings of glands give a somewhat pitted appearance. Spot behind femur insertion scarcely discernible.

Color.—Above brown, with a lighter cream spot on snout in front of eyes; a pair of indefinite lighter areas on nuchal region; an indistinct row of darker flecks along the dorsolateral line, bordered above posteriorly by a lighter streak; tail brownish faun, lighter at base, growing darker low on sides, and flecked with black; underside of body and tail, and to some extent low on sides of body, uniform brown; under lens small whitish flecks visible; some lighter flecks present on sides of neck and below eye.

Measurements in mm.—Length, snout to end of vent, 32.3; tail 37; width of head, 4.5; length of head from tip of snout to midventral part of gular fold, 5.5 (6.5 mm. when measured on side of neck to ends of gular fold); width of head in snout-vent length, 7.2 times; length of head in snout to vent length, about 5 times.

Variation.—The color and markings of this species varies considerably as do many of the species of this genus. The dorsal color may vary from dark blackish brown, to faun with a pattern of darker markings. For the most part the darker coloration is found in males, the lighter in females.

No. 1416 has the ground color faun with a somewhat Y-shaped mark on the occiput, a well-defined cream-colored area on the sides of nuchal region, and a series of 15 more or less well-defined chevrons along the back. A dorsolateral line is present, below which is a light stripe running from axilla to groin. Tail above and on sides faun with dark brown flecks; the underside of body and tail dark brown with minute light flecks; the chin is lighter than venter. One of the young specimens follows this pattern closely.

The variation in length of limb, in proportion to the axilla to groin length, is the same in all of the paratypes. The dorsal groove is the same in all. The males have a little larger swelling on lip below nostril, the teeth, both vomerine and maxillary are fewer, and the cloacal walls are more or less papillate.

The peculiar palatal opening is present in all the adults and one of the young; it is not discernible in two other young specimens.

Remarks.—The diversity of color pattern is especially similar to that which obtains in the small terrestrial members of this genus that occur on the northern part of the Mexican plateau. The sexual dimorphism in the number of teeth likewise is a generic character.

The purpose of the palatal perforation is unknown to me but it may represent a method whereby some part of the cranial cavity may be used for an accessory respiratory organ.

Two other diminutive species with which this species may be confused are "*Oedipus*" *picadoi* Stejneger and *Parvimolge richardi*, both of which occur in Costa Rica. The first species may be differentiated easily by the enlarged nostril of the young and adults; and *Parvimolge* by the structure of hands and feet, especially the enlarged elongate middle digit.

Table of Data on *Chiropterotriton abscondens* sp. nov.

No.	Snout to vent	Tail	Head width	Head length	Head width in length	Head length in length	Maxillary teeth	Premaxillary teeth	Vomerine teeth
1414 ♀	32.3	37	4.5	5.5	7.2	5.87	23-23	6	8-8
1415 ♂	31	---	4.3	5.8	7.1	5.34	14-15	6	6-6
1411 ♀	30	---	4.2	5.8	7.1	5.19	19-19	4	6-7
1412 ♂	29.9	37.3	4.4	5.7	6.8	5.24	15-16	4	6-5
1410 ♀	28	36	4.2	5.5	6.9	5.27	22-22	6	8-8
1416 ♂	28.5	37.3	4	5.4	7.1	5.27	16-15	4	6-7
1413 ♂	24.2	26.7	3.8	4.6	6.3	5.26	14-13	5	7-6
1417 ♂	21.8	25	3.35	4.1	6.5	5.41	12-12	4	4-5

Oedipina syndactyla sp. nov.

Type.—University of Kansas Museum of Natural History No. 843, taken at an elevation of about 7,000 feet, 4 miles west (by road) from Isla Bonita (American Cinchona Plantation), Volcán Poas (Eastern Caribbean drainage), Costa Rica; Edward H. Taylor, collector.

Diagnosis.—Snout bluntly pointed; eye large, longer than snout, equal to its distance from tip; groove from nostril deflected strongly backwards and small labial swelling on lip distinctly behind, instead of below, nostril; 20 costal grooves; limbs separated by 14-15 costal folds; digits fused together rather than webbed, the extreme tips of 2 fingers on hands, and three toes on feet, free; 27-29 maxillary teeth; 4 premaxillary teeth; 10-11 vomerine teeth; paravomerine teeth in two distinct elongate patches; neither hands nor feet as wide as their respective limbs.

Description of the type.—Head elongate, narrow, rather bluntly pointed anteriorly (nostrils distinctly back from tip); eye large, its length greater than snout length, equal to its distance from tip; distance between nostrils equal to their distance from eye; eyelids not tucked under a fold posteriorly; a strong, curved, gular fold with a lateral nuchal groove from its end passing up on side of neck but not reaching mid-dorsal line; a dim transverse groove anterior to gular fold passes up on sides of head to dorsal surface; a dim arched groove on throat and chin, the sides of the arch resting on the transverse groove; a very dim groove from eye to the lateral nuchal groove.

A well-defined free sublingual fold; 27-29 maxillary teeth begin slightly farther back than middle of eye; vomerine teeth 11-10, beginning outside level of choanae, then curving in and back, narrowly separated mesially; 4 premaxillary teeth; 33-36 mandibular teeth; tongue free; paravomerine teeth in two elongate patches more or less together anteriorly, separated from vomerine teeth by twice diameter of choanae.

Arms short, when extended along body their length equal to about $2\frac{1}{2}$ folds; legs about same size; hands and feet small; digits grown together, tips of two middle fingers and three middle toes equally free, bluntly pointed; outer digits small, completely fused with adjoining digit.

Skin very smooth, even under a lens the openings of the glands not or scarcely discernible (except for a specialized somewhat depressed occipital area reaching to between eyes in which pits are especially distinct); 20 costal grooves, indistinct, the costal folds not elevated; tail presumably with a basal constriction (tail severed immediately behind vent); cloacal walls smooth with indications of lateral folds.

Color.—Slate gray above, gray below; edge of gular fold cream; chin lighter than venter; a cream spot below insertion of arms and legs, and undersurface of upper arm and leg with cream markings; a light glandular area behind insertion of leg; lower eyelid somewhat cream, and a lighter line following the groove from nostril to lip.

Measurements in mm.—Snout to end of vent, 54.8; tail short, with terminal regenerating portion broken off immediately behind vent; width of head, 4.3; length to median part of gular fold, 7.5; axilla to groin, 38; snout to arm insertion, 10.6; head width in snout-to-vent length, 12.7 times; head length in same, 7.3 times.

Remarks.—The unique specimen was captured in more or less open pastured land at an elevation of about 7,000 ft on Volcán Poas. Other species of the genus *Oedipina* were taken at about the same elevation.

This species differs from all known members of the genus in having the body more attenuated, and the distance between the adpressed limbs greater (width of 14-15 costal folds).

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